A mixed-methods approach toward promoting and evaluating the Congregate Meal Program in Linn County

Savannah Rae Schultz

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A mixed-methods approach toward promoting and evaluating the Congregate Meal Program in Linn County

by

Savannah Schultz

A thesis submitted to the graduate faculty
in partial fulfillment of the requirements for the degree of

MASTER OF SCIENCE

Major: Diet and Exercise

Program of Study Committee:
Sarah L. Francis, Major Professor
Lorraine Lanningham-Foster
Jeongeun Lee

The student author, whose presentation of the scholarship herein was approved by the program of study committee, is solely responsible for the content of this thesis. The Graduate College will ensure this thesis is globally accessible and will not permit alterations after a degree is conferred.

Iowa State University
Ames, Iowa
2020

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# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>LIST OF FIGURES</td>
<td>iv</td>
</tr>
<tr>
<td>LIST OF TABLES</td>
<td>v</td>
</tr>
<tr>
<td>NOMENCLATURE</td>
<td>vi</td>
</tr>
<tr>
<td>ACKNOWLEDGMENTS</td>
<td>vii</td>
</tr>
<tr>
<td>ABSTRACT</td>
<td>viii</td>
</tr>
<tr>
<td>CHAPTER 1. INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>Background</td>
<td>1</td>
</tr>
<tr>
<td>Goals and Objectives</td>
<td>3</td>
</tr>
<tr>
<td>Thesis Organization</td>
<td>4</td>
</tr>
<tr>
<td>References</td>
<td>6</td>
</tr>
<tr>
<td>CHAPTER 2. REVIEW OF LITERATURE</td>
<td>9</td>
</tr>
<tr>
<td>Older Americans Act</td>
<td>11</td>
</tr>
<tr>
<td>Congregate Meal Program</td>
<td>12</td>
</tr>
<tr>
<td>Nutritional Risk among Older adults</td>
<td>13</td>
</tr>
<tr>
<td>Socioeconomic Factors</td>
<td>14</td>
</tr>
<tr>
<td>Health Factors</td>
<td>19</td>
</tr>
<tr>
<td>Summary</td>
<td>28</td>
</tr>
<tr>
<td>Congregate Meal Program Participation</td>
<td>29</td>
</tr>
<tr>
<td>Social Marketing Theory</td>
<td>32</td>
</tr>
<tr>
<td>Conclusion</td>
<td>35</td>
</tr>
<tr>
<td>References</td>
<td>35</td>
</tr>
<tr>
<td>CHAPTER 3. METHODOLOGY</td>
<td>49</td>
</tr>
<tr>
<td>Study 1: Congregate Meal Program Needs Assessment</td>
<td>49</td>
</tr>
<tr>
<td>Study design</td>
<td>49</td>
</tr>
<tr>
<td>Recruitment</td>
<td>49</td>
</tr>
<tr>
<td>Data collection</td>
<td>50</td>
</tr>
<tr>
<td>Data analysis</td>
<td>52</td>
</tr>
<tr>
<td>Study 2: Linn County Innovations in Nutrition Program Impact Study</td>
<td>53</td>
</tr>
<tr>
<td>Introduction</td>
<td>53</td>
</tr>
<tr>
<td>Intervention Description</td>
<td>53</td>
</tr>
<tr>
<td>Program Awareness and Utilization Assessment</td>
<td>54</td>
</tr>
<tr>
<td>Program Satisfaction</td>
<td>56</td>
</tr>
<tr>
<td>CMP Evaluation</td>
<td>58</td>
</tr>
<tr>
<td>References</td>
<td>63</td>
</tr>
</tbody>
</table>
# LIST OF FIGURES

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Figure 2-1</td>
<td>Congregate Meal Program (CMP) Participation Rates by Year and Age (data.iowa.gov)</td>
<td>29</td>
</tr>
<tr>
<td>Figure 2-2</td>
<td>Social Marketing Theory Cyclic Model (Lefebvre &amp; Rochlin, 1997; Storey, Saffitz, &amp; Rimón, 2008)</td>
<td>34</td>
</tr>
<tr>
<td>Figure 4-1</td>
<td>Factors Influencing Successful Aging</td>
<td>75</td>
</tr>
<tr>
<td>Figure 4-2</td>
<td>Congregate Meal Program Attendance Motivators</td>
<td>77</td>
</tr>
<tr>
<td>Figure 5-1</td>
<td>Social Marketing Theory Cyclic Model</td>
<td>91</td>
</tr>
<tr>
<td>Figure 5-2a-b</td>
<td>Participation Rates and Number of Meals Served at Congregate Meal Sites Involved in the Intervention</td>
<td>98</td>
</tr>
<tr>
<td>Figure 5-3</td>
<td>Dining Satisfaction at POST</td>
<td>101</td>
</tr>
</tbody>
</table>
LIST OF TABLES

Table 2-1. Congregate Meal Program Participation Eligibility (HHS, & ACL, 2019) .... 12

Table 2-2. Prevalence of Chronic Diseases with Increased Age (Iowa Department of Public Health, 2016) ........................................................................................................................................ 22

Table 3-1. Standard Focus Group Questions .......................................................................................................................... 51

Table 4-1. Focus Group Questions ............................................................................................................................................. 70

Table 4-2. Focus group participants’ sociodemographic characteristics .......................................................... 72

Table 4-3. Food behaviors and health of focus group participants (n=32)............................................. 74

Table 5-1. Sociodemographic Characteristics of Satisfaction Survey Respondents ........ 99

Table 5-2. Sociodemographic Characteristics of Evaluation Study Respondents .......... 102

Table 5-3. Food and Health Characteristics of Respondents for the Evaluation Survey............................................................................................................................................. 103

Table 5-4. Unadjusted Loneliness and Nutritional Outcomes of Participants (n=47 total).................................................................................................................................................................................. 104
# NOMENCLATURE

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMP</td>
<td>Congregate Meal Program</td>
</tr>
<tr>
<td>OAA</td>
<td>Older Americans Act</td>
</tr>
<tr>
<td>AAA</td>
<td>Area Agency on Aging</td>
</tr>
<tr>
<td>FG</td>
<td>Focus group</td>
</tr>
<tr>
<td>NR</td>
<td>Nutritional risk</td>
</tr>
<tr>
<td>DST</td>
<td>Dietary Screening Tool</td>
</tr>
<tr>
<td>DIF</td>
<td>Dietary Intake Frequencies</td>
</tr>
</tbody>
</table>
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ABSTRACT

Congregate Meal Program (CMP) participation is declining. This is concerning because of the growing older adult population. This two-part study applied the Social Marketing Theory to examine how to make the CMP more appealing for current and potential CMP participants and to evaluate to what extent a revised CMP marketing campaign impacts CMP awareness, utilization, satisfaction, and overall impact.

Study 1 entailed the facilitation of four focus groups (FG) (3 at meal sites $n=21$; 1 at senior apartments $n=11$) to identify CMP needs and preferences. FG transcripts were analyzed for themes using standard focus group protocol. Overall, FG participants wanted to attend the CMP for the affordable, healthy meal and the accessibility of the meal site as well as the opportunities for socialization. Non-CMP participants from the FG were not attending due to the lack of awareness and perceived need to participate in the CMP as well as transportation barriers. FG participants stated the ideal CMP would include meal choice, variety of activities and food options, as well as a positive and welcoming ambience. Preferred marketing routes were word of mouth, free local print media and television. This information was utilized in the design and implementation of extensive advertising and the Encore Café (Study 2). Study 2 involved multiple assessment surveys evaluating CMP awareness of community partners, CMP utilization and participant satisfaction, and CMP impact. CMP satisfaction was evaluated with a Traditional CMP and Innovations CMP participants. Overall CMP impact was assessed with Innovations CMP participants and non-CMP participants (Comparison). There was a significant increase in CMP awareness and CMP referral intentions ($p=.017$). Additionally, there was a 386% increase in CMP meal distribution and 3,164% increase
in CMP participants. High CMP program satisfaction for both Traditional and Innovations CMP was noted. The Innovations group maintained their nutrition status and experienced a significant reduction in emotional loneliness \( (p=0.017) \) and consumed significantly lower dietary intake frequencies of processed meat \( (p=0.027) \) compared to non-CMP participants. These findings indicate that addressing the needs and preferences of older adults and establishing an effective marketing campaign may result in increased CMP participation, awareness and high satisfaction.
CHAPTER 1. INTRODUCTION

Background

The older adult population, aged 65 years and over, is the fastest growing age group in the United States (U.S.) with a 34% increase over the past 10 years (2007-2017). This population is expected to double by 2060 (Administration on Aging [AoA], Administration on Community Living [ACL] & Department on Health and Human Services [HHS], 2019). This growth is attributable to the baby boomer era (people born between 1946 and 1964) and the increasing number of “oldest old” adults (those aged 85 years and older). The population aged 85 years and over is predicted to see a 123% increase in the next 20 years (AoA et al., 2019). Ensuring there are effective older adult-focused community health programs is crucial in maintaining older adults’ health.

The Older Americans Act (OAA) provides numerous services that supports the health and wellbeing of the older adult population. The Congregate Meal Program (CMP) is part of the community-based Nutrition Services funded through the OAA. This program is a vital community food and nutrition service that enables successful aging (Sylvie, Jiang, & Cohen, 2013). CMP participants reported the CMP helping them eat healthier and remain independent (AoA, 2013; Mabli et al., 2017). CMP participants were also satisfied with the socialization opportunities through the CMP (AoA, 2013; Mabli et al., 2017). Despite the benefits the CMP provides and the growing older adult population, participation is declining nationally (ACL,
In Iowa where the older adult population (16.1%) is currently higher than the national average (14.9%), there has been a 46% decline in CMP participation from 2011 to 2017. (U.S. Census Bureau, 2017; ACL, 2017). In the same period, Linn County, Iowa experienced a greater CMP participation decline of 74% (Heritage Area Agency on Aging, 2019).

One factor influencing participation decline is limited CMP funding (Fox-Grage, & Ujvari, 2014). Federal funds cover 44% of the costs needed to support the CMP, which has led to the closure of meal sites, establishment of wait-lists, and decreased days that meals are served (Lloyd & Wellman, 2015). This limited funding for the CMP may be attributable to the limited program impact data available documenting its value. The CMP assesses nutritional risk (NR) annually using the ‘Determine Your Nutritional Health’ (NSI) checklist which is better utilized as an awareness tool and not as a measure of nutritional risk (Beck, Ovesen, & Osler, 1999; Brunt, 1999; De Groot, Beck, Schroll, & van Staveren, 1998; Rush, 1993; Sahyoun, et al., 1997; Sinnett et al., 2010; Vieira, Assunção, Schäfer, & Santos, 2016). Moreover, there is lack of CMP support and awareness from health care professionals. Mabli and others (2017) report that less than 8% of CMP participants were referred to the CMP from community-based organizations including where they receive health care.

The Social Marketing Theory (SMT) is a cyclic model that has promoted the design of successful nutrition programs for the older adult population (Francis & Taylor, 2009; Francis, Taylor, & Strickland, 2004;
Roy et al. 2016; Tan et al., 2010). An essential characteristic of the SMT is obtaining information including unique needs and preferences from the target population (SMT Step 1), (Lefebvre & Rochlin, 1997; Storey, Saffitz, & Rimón, 2008). This information is applied to help identify and develop program messaging and materials (SMT Steps 2 and 3) that are then implemented and evaluated for effectiveness (SMT Steps 4 and 5) and improving it based on those results (SMT Step 6; Lefebvre & Rochlin, 1997; Storey, Saffitz, & Rimón, 2008).

Therefore, the aim of this two-part study was to apply the SMT to identify the needs and preferences of older adults that take part in the CMP and to assess the effectiveness of an intervention that a local Area Agency on Aging implemented with the information in Study 1.

**Goals and Objectives**

**Study 1: Congregate Meal Program Needs and Preferences Assessment**

Objective: The aim of this study was to use a qualitative focus group design to understand how to make the CMP more appealing for current and potential participants. The following research questions were addressed:

1. What factors influence an older adult’s decision whether to attend the CMP including motivators, barriers, and facility attributes?
2. What meal preferences are perceived as appealing?
3. What is the desired structure for programs/events and topic interests?
4. What are preferred marketing routes?
What is needed for older adults to age successfully in their communities?

Study 2: Linn County Innovations in Nutrition Program Impact Study

Objective: The aim of this study was to conduct a quantitative assessment on the impact of the Linn County Innovations in Nutrition Program (LCINP), an intervention that reflected the results from Study 1. The following research questions were addressed:

1. To what extent does a focused marketing campaign influence CMP and Area Agency on Aging program awareness?
2. To what extent does the LCINP influence participation rates and number of meals served over a two-year period?
3. To what extent does the type of CMP (Innovations versus Traditional) affect program satisfaction among participants?
4. To what extent does participation in the LCINP impact:
   a. Nutritional Risk,
   b. Dietary intake frequencies,
   c. Loneliness, and
   d. Healthy eating self-efficacy.

Thesis Organization

This thesis starts with a review of literature on the growing older adult population and the services the CMP offers for successful aging. Then literature on factors influencing the nutritional health of older adults are presented along with how the CMP mitigates these effects. The literature
review will end with reasons contributing to the declining CMP participation and how the SMT offers solutions to this problem. The methodology follows with comprehensive information on how the two studies were completed. The next two chapters are the manuscripts that will be submitted to *Journal of Nutrition in Gerontology and Geriatrics*. This thesis ends with general conclusions of both studies and a comprehensive reference list.
References


CHAPTER 2. REVIEW OF LITERATURE

Health is a fundamental determinant on whether an older adult will maintain independent in their community. Health, defined by the World Health Organization (WHO) in 1946, is a “state of complete physical, mental and social well-being and not merely the absence of disease or infirmity” (n.d). Addressing health risk factors common among older adults, including injury, development of non-communicable diseases, poverty, and social isolation are key in preventing or reducing ill health among older adults (WHO, 2018). The Older Americans Act (OAA) supports community programs, such as the Nutrition Services that are constructed to promote health and functionality, socialization within the community and lessening the effects of declining physical health to ultimately maintain older adults’ independence (Kowlessar, Robinson & Schur, 2015; U. S. Department of Health and Human Services [HHS], & Administration for Community Living [ACL], 2019). The Nutrition Services are paramount in mitigating adverse health effects associated with aging.

Growing population

Older adults are the fastest growing age group in the United States (U.S.). The population of adults aged 65 years and over increased by 34% over the past 10 years in the U.S. (2007-2017) and the population aged 45 to 64 years old increased by 9% ensuring a continuing growth of older adult population (Administration on Aging [AoA], ACL & HHS, 2019). In Iowa, there has been a similar trend with a percentage of older adults currently
above the national average (16.1% versus 14.9%) (U.S. Census Bureau, 2017). This growth is expected to continue with the population of those aged 65+ years, doubling by 2060 (AoA et al., 2019). Additionally, it is predicted there will be a 123% increase by 2040 of the older adult population aged 85 years and over (AoA et al., 2019).

This growth is a consequence of the baby boomer era. By the end of the baby boom (1946-1964), there was almost 72.5 million babies accounting for 37% of the total population (Colby & Ortman, 2014). The baby boomer population continued to increase up until 1999, reaching a peak of 78.8 million people, an increase primarily due to immigration (Colby & Ortman, 2014). In 2011, baby boomers started to turn age 65 years and now one-third (31%) of baby boomers are classified as an older adult (65 years and older) (AoA et al., 2019). All baby boomers will be between ages 66 and 84 years old in 2030 with a population size of 60 million (Colby & Ortman, 2014).

Equally important to the baby boomer era is how this large group of individuals impacts society. When analyzing the changing old age dependency ratio, which is the comparison of the number of adults aged 65 years and older to those in the working class aged 18 to 64 years, there has been a steep increase starting in 2010 (Colby & Ortman, 2014). By 2030, the old age dependency ratio is estimated to be at 35, resulting in an additional 14 older adults per one-hundred working-age adults, and by 2056 old age dependency will surpass youth dependency for the first time in history (Colby & Ortman, 2014). This future prediction is paramount when planning for the
future as a society. For example, older adults accounted for 13% of the U.S. population but contributed to 33% ($51.3 billion) of the total annual costs of disease-associated malnutrition (Snider et al., 2014). These costs will continue to grow with the expanding older adult population if left untreated. Therefore generating the need for community-based services directed towards maintaining and/or improving the nutritional health of older adults is imperative.

Community-based food and nutrition services is one way the health and well-being of older adults can be addressed. Currently, the OAA supports the well-being of older adults through multiple services including the Congregate Meal Program (CMP), which has been identified as a vital community food and nutrition program that enables older adults to age successfully by maintaining their health (Sylvie, Jiang, & Cohen, 2013).

**Older Americans Act**

The OAA of 1965 provides essential services that enable older adults to continue living independently in their community (Fox-Grage & Ujvari, 2014). The OAA is the primary community food and nutrition program for older adults, which is comprised of a variety of programs, administrations and organizations designed to aid adults 60 years and older in their overall life. Through Title III of the OAA, adults age 60 years and older are supported with in-home and community-based long-term care services including transportation, assistance in identifying supportive services, outreach, legal services, adult day care (e.g. respite care); Nutrition Services
through the CMP and home delivered meals; Disease Prevention and Health Promotion; and Family Caregiver Support (Greenlee, 2013). The Nutrition Services Program promotes access to nutritious meals, nutrition education and counseling; encourages socialization, and coordinates health promotion activities for older adults through the congregate meal program (Mabli et al., 2017).

**Congregate Meal Program**

The Nutrition Services of the OAA has a community sector, which is accomplished though the CMP. The CMP aims to maintain independency among older adults by reducing hunger and food insecurity, and prolonging health and well-being free of adverse health conditions as well as encouraging socialization (Kowlessar et al., 2015). A key strength of the CMP is the meals are free and based on voluntary donations, therefore those who meet the participation eligibility cannot be denied a meal (Table 2-1).

Table 2-1. Congregate Meal Program Participation Eligibility (HHS, & ACL, 2019)

To participate in the CMP, adults must be either:

- age 60 years and older (spouse of any age can accompany)
- disabled and younger than 60 years who either live in an older adult housing facility where congregate meals are served, or live with and accompanied with an adults age 60 and older to the meal site
- serve as a nutrition service volunteer
The goal of the CMP is to help maintain the independence of community-residing older adults. Nearly three-quarters (71%) of CMP participants said the program helped them live independently and stay in their home (Mabli et al., 2017). The CMP does this by offering nutrition care, socialization opportunities and informative events.

The primary service of the CMP is to administer nutritious meals. All meals provided through the CMP are required to provide at least one-third of Dietary Reference Intakes and must comply with the most recent Dietary Guidelines for Americans (HHS & ACL, 2019). Administration on Aging (2013) reported that three-quarters (75%) of meal site participants indicated that the program helped them with eating healthier. Additionally, nearly all (94%) rated the meals as either “good” or “excellent” and most (97%) would recommend the program to a friend (AoA, 2013). Furthermore, it was discovered that over one-half (56%) felt the CMP provided one-half or more of their total food for the day and most (83%) indicated the program helped them feel better (AoA, 2013). Additionally, almost all (94%) were satisfied with their opportunities for socialization (Mabli et al., 2017). Such a community-based food and nutrition program that produces these results is imperative for a growing population that is at greater risk for having a compromised health status.

Nutritional Risk among Older adults

Older adults are at high nutritional risk, which is influenced by many factors including dietary intakes, socioeconomic status, food security, chronic
disease, health care utilization and loneliness. About one-quarter (24%) of community-residing older adults are at risk for malnutrition (Guigoz, 2006). In fact, nutritional risk rates are higher with every yearly increase in age (Chatindiara et al., 2018). Malnutrition in community-residing older adults increases with poverty (FAO, 2008; Samuel et al., 2012; Ziliak, Gundersen, & Haist, 2015), poor dietary intake (Hengeveld et al., 2018; Landi et al., 2016), presence and number of chronic diseases (Fabian et al., 2011; Guigoz, 2006; Heuberger & Caudell, 2011; Ortolani et al., 2013), and loneliness (Boulos, Salameg, & Gateau, 2016; Cornwell & Waite, 2009). In addition, malnutrition interferes with independence among older adults by adversely affecting their health. Malnutrition can contribute toward sarcopenia, a depressed immune system, longer hospital stays, higher hospital re-admission rates as well as greater health care costs and long-term care patient mortality (Agarwal et al., 2013; Barker, Gout, & Crowe, 2011; Souza et al., 2015).

**Socioeconomic Factors**

**Low socioeconomic status**

Nutritional status is adversely affected by low socioeconomic status (SES). SES consists of income, education and occupational status (Cowan, et al., 2012). A lower SES among an older adult is correlated with insufficient education attainment, poverty and poor health (American Psychological Association, n.d). Simsek, Doganay, Budak and Ucku (2013) reported those with less education were at a higher risk of consuming an unhealthy diet and believed their health to be “poor” or “very poor” than those with more
education. Additionally, lower education is a predictor of low health literacy among older adults, which is associated with poorer outcomes including higher rates of healthcare utilization and expenditures, as well as lower healthcare satisfaction and compliance with evidenced-based measures, what the physician recommends that patient does to stay healthy and/or manage a disease (Gulyas et al., 2016). Knowledge has been reported as one of the top three factors predicting healthy food consumption among older adults (Shaikh et al., 2008). The CMP provides monthly nutrition education that can combat this problem (HHS & ACL, 2019). Nutrition education is successful in producing behavior change including reducing nutrition risk (Francis, MacNab, & Shelley, 2014; Wunderlich, Bai, & Gallop, 2010), and improving dietary intakes (Brewer et al., 2016; Francis, Taylor, & Haldeman, 2009; Francis et al., 2014; MacNab, Davis, Francis, & Violette, 2017; Santiago et al., 2014; Wunderlich et al., 2010, Young et al., 2011). The CMP helps by providing participants with skills and knowledge to continue to maintain a healthy eating pattern at home.

Poverty is also part of SES and can impact health outcomes. About 7.3% of older Iowans live below the poverty level compared to 9.3% of older adults nationwide (U.S Census Bureau, 2017). An additional, 10% of older Iowans are classified as “near-poor” (U.S Census Bureau, 2017). These poverty rates more than double (14.1%) when using the Supplemental Poverty Measure (AoA et al., 2019). The Supplemental Poverty Measure takes into account non-cash benefits (e.g. Supplemental Nutrition Assistance
Program), housing cost variation and non-discretionary expenditures including medical out-of-pocket expenses (AoA et al., 2019). Furthermore, low income as well as chronic pain, functional limitations, psychological distress are correlated with higher rates of worry for health care costs among older adults (Choi, & DiNitto, 2016). Health care costs constitute over one-fourth of the mean income for older adults with Social Security (90%) (U.S Census Bureau, 2017). In 2016, out-of-pocket health care costs averaged to $5,994 for older adults (65+ years), which is a 38% increase from 2006 (AoA et al, 2018). Although, a majority (93%) of older adults have Medicare, about one-half of health care costs are not covered by the plan (AoA et al, 2019). In addition, a small, but notable proportion of older adults (3%), did not receive needed medical care due to health care costs (AoA, et al., 2019). Furthermore, financial stress contributes to lowered nutritional status. Samuel and others found an association between financial stress and increased malnutrition risk among community-residing older adult women (2012). Finally, average health care expenditures are higher among CMP participants with lower income compared to those with higher incomes (Mabli et al., 2018). Subsequently, CMP participants with low income have more burdens like struggling to make ends meet which has led them to make difficult choices on what necessity they would purchase to remain in good health such as medications, food, rent and utilities (Mabli et al., 2017). For example, almost one-half (42%) of the CMP participants surveyed by Mabli and others indicated they would skip meals or eat less if the CMP was unavailable
(2017). However, diet quality among high income and low income CMP participant did not differ and both had better diet quality compared to non-participants with similar demographics (Mabli et al., 2017).

Ziliak and others (2015) have estimated that of those older adults living below the poverty line, 49% face the threat of hunger, 31% face the risk of hunger and 13% are facing hunger. Additionally, for older adults above the poverty line, nearly two out of three are at risk of being hungry (Ziliak et al., 2015). The Food and Agriculture Organization of the United States (FAO) (2008) states that, “… all hungry people are food insecure, but not all food insecure people are hungry, as there are other cause of food insecurity, including those due to poor intake of micro-nutrients.”

Furthermore, food insecurity is the leading cause of nutrition risk among older adults while low SES is the leading cause of hunger among older adults (FAO, 2008). The CMP can help by providing nutritious meals for anyone over 60 years and older with no questions asked.

**Food insecurity**

Having adequate access to food is essential for older adults to maintain their health and thus, their independence. Hernandez, Reesor and Murillo (2017) define food insecurity as the lack of availability or access to healthful food because of insufficient money or other resources. About 1 in 11 older adults do not have adequate access to food (USDA Economic Research Service, 2019). Goldberg and Mawn (2015) assessed possible predictors of food insecurity in older adults through the socioecological
model. At the intrapersonal level, factors such as marital status, race and ethnicity, and education level, were among the strongest predictors of food security status (Goldberg & Mawn, 2015). Food insecurity rates among older adults who have been divorced or separated are two to three times greater when compared to those who are married (Ziliak et al, 2015). In the United States a majority of men were married (70%) compared to less than one-half (46%) of women, and more women were widowed (33%) compared to men (11%) (AoA et al., 2018). As a result, more women are living alone (34%) compared to men (21%) and this proportion also increases with age (AoA et al., 2018). Food insecurity also differs among race, with persons of color experiencing higher rates of food insecurity compared to those who are white (Vaccaro, & Huffman, 2017). Currently, Iowa’s older adult population is primarily white (96.9%), however, the diversity of this population is expected to grow (U.S. Census Bureau, 2017). Nationally, in 2016 there was a 23% increase in the number of older adults identifying as a person of color, which is predicted to reach 89% by 2030 (AoA et al., 2018). Furthermore, the older adult U.S population, including Iowa is mostly educated with less than one-fifth (17.2%) not receiving a high school education nationally and 11.5% in Iowa (U.S Census Bureau, 2017). The future older adult population will continue to increase education attainment because more young adults are receiving college degrees and graduating high school (U.S. Census Bureau, 2017).
One means of helping reduce food insecurity for community-residing older adults is through the CMP. Older adults who receive congregate meal services are more likely to be food insecure than those who are not receiving this service (Lloyd & Wellman, 2015). However, CMP participants have lower rates of food insecurity compared to non-participants of similar demographics (Mabli et al., 2017). Despite being more likely to be food insecure, the CMP helps reduce food insecurity rates among participants. The CMP aids by providing participants around 39 to 47% of their daily nutrients through the meals (Mabli et al, 2017). Furthermore, the Academy of Nutrition and Dietetics concludes that having adequate funding and increased participation of food and nutrition assistance programs, in addition to innovative programs that advocate economic self-sufficiency, are the paramount actions for decreasing food insecurity (Holben, & Marshall, 2017).

**Health Factors**

**Dietary Intake**

Dietary intake is the main component influencing nutritional status, however certain aspects of aging can make it difficult to obtain the recommended nutrients. Older adults can experience physiological changes, such as poor appetite and reduced functionality that result in reduced dietary intake, which has been termed “anorexia of aging” (Landi et al., 2016). Poor appetite affects nearly one-quarter (21.8%) of older adults (Van der Meji et al., 2017). Decreased appetite can lead to overall smaller portion sizes,
however, meals are typically higher in dairy foods, fats, oils, sweets and sugary beverages and significantly lower in protein, dietary fiber (e.g. whole grains, fruits, and vegetables), and solid foods compared to those with a good appetite (Van der Meji et al., 2017). A serious side effect for older adults with poor appetite is the development of protein-energy malnutrition (Hengeveld et al., 2018). Malnutrition and physical functionality exacerbate each other and can potentially result in sarcopenia, the age-related decline in muscle mass and functionality (McLean et al., 2014).

Sarcopenia has deleterious effects on older adults’ quality of life including increased mortality (Beasley, Shikany, & Thomson, 2013; Gariballa & Alessa, 2018), frailty (Beasley et al., 2010; McLean et al., 2014) and loss of independence (Engelhardt et al., 2018; Gariballa & Alessa, 2018). Sarcopenia can also result in a higher frequency of hospital readmissions (Garbialla & Alessa, 2018). For optimal health and physical functioning, it has been suggested that older adults should consume higher amounts of protein, than what is currently recommended (Beasley et al., 2013; Volpi et al., 2013) as well as be physically active (Martone et al., 2017; Franzke, et al., 2018).

Older adults who seek out food assistance resources, such as the CMP, are typically at higher risk for having poor nutritional status. For example, MacNab and others (2018) found the majority of older adults attending community-based lifestyle programs were classified as “at potential nutritional risk” (53.7 %) or “at nutritional risk” (26.4 %). Furthermore, those
who were at nutritional risk had lower intakes of protein-rich foods, produce and whole grains (MacNab et al., 2018). Similarly, Krok-Schoen, Price, Kelly, and Taylor (2019) reported that up to 46% of older Americans not meeting current protein recommendations. In addition, in Iowa over one-third (37.4 %) of adults ages 65-74 years are eating less than one fruit per day and less than one-fourth (22.7 %) eating less than one vegetable per day (BRFSS, 2015). It has been suggested that older adults with higher diet quality is associated with better physical performance as they age, which can help combat anorexia of aging (Robinson et al., 2017; Landi et al., 2016).

The CMP is an advocate of providing evidence-based programming that maintains the physical functioning of older adults, such as Tai Chi (Taylor-Piliae et al., 2014) and Matter of Balance (Chen, Edwards, & Janke, 2015). Additionally, as mentioned earlier nutrition education, which is provided by the CMP, has shown positive results improving dietary intake (Brewer et al., 2016; Francis, Taylor, & Haldeman, 2009; Francis et al., 2014; MacNab, Davis, Francis, & Violette, 2017; Santiago et al., 2014; Wunderlich et al., 2010, Young et al., 2011).

**Chronic Diseases**

The nutritional status of older adults can predict and be impacted by the presence of chronic disease. For example, poor nutrition is a leading cause of many chronic diseases among older adults (Eggersdorfer et al., 2018). In Iowa the proportion of the population having a chronic disease increases with age (Table 2-2). Over one-half of the older Iowan population
has hypertension and/or high blood cholesterol, which are risk factors for cardiovascular disease. Cardiovascular is the leading cause of death in the United States for those ages 65 years and older (CDC, 2017), so it is imperative to address any modifiable factors for longevity among older adults. Many of the main risk factors for these leading chronic disease conditions can be attenuated through nutrition. Healthy dietary habits help reverse chronic disease complications and can be more effective than drug treatment (Allam & Arjona, 2013; Diabetes Prevention Program Research Group, 2006; Radonjic et al., 2013; Ravera et al., 2016). Both patients and physicians indicate nutrition being most important in the management and treatment as well as the prevention of chronic diseases (Coombs, Barrocas, & White, 2004).

Table 2-2. Prevalence of Chronic Diseases with Increased Age (Iowa Department of Public Health, 2016)

<table>
<thead>
<tr>
<th>Chronic Disease</th>
<th>Percentage (%) of Older Adults with Chronic Disease</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>55-64 years</td>
</tr>
<tr>
<td>Hypertension</td>
<td>42.2</td>
</tr>
<tr>
<td>Hypercholesterolemia</td>
<td>47.1</td>
</tr>
<tr>
<td>Cardiovascular Disease</td>
<td>10.9</td>
</tr>
<tr>
<td>Diabetes</td>
<td>13.3</td>
</tr>
</tbody>
</table>
Despite the benefit of nutrition in preventing and treating the aforementioned chronic diseases, often older adults are prescribed medications to help treat them. The majority (81%) of older adults rely on medication to treat and manage their chronic conditions with about one-half taking more than one mediation and among those with polypharmacy over one-half are taken five or more prescription medications (Coombs, Barrocas, & White, 2004; Heuberger, & Caudell, 2011). Among CMP participants, over two-thirds (68.9%) take three or more prescription medications every day (Mabli et al., 2018). Polypharmacy may decrease an older adult’s nutritional status through potential drug-nutrient interactions (Fabian et al., 2011; Heuberger & Caudell, 2011; Ortolani et al., 2013). For example, taking three or more medications daily adversely impacts the status of some vitamins (e.g., vitamin D, K, B(6) and folate) in older adults (Fabian et al., 2011), as well as attributes toward higher health care costs, adverse drug effects, drug-interactions, medication non-adherence, geriatric syndromes (Maher, Hanlon, & Hajjar, 2014) and decreased functional status (Maher, Hanlon, & Hajjar, 2014; Ortolani et al., 2013; Peron, Gray, & Hanlon, 2011), whereas diet interventions have beneficial effects (Ravera et al., 2016).

The benefit of mitigating chronic disease through nutrition is well-established. However, the majority (80%) of older adult patients rely on nutrition information from their physician, who have minimal nutrition knowledge (Coombs, Barrocas, & White, 2004). Providing older adults with quality nutrition education and services are important if they are to stay
nutritionally well. The CMP supplies nutrition education as well as opportunities to participate in age-appropriate physical activity that can improve health through analysis of increased dietary scores, anthropometrics and biochemical data (Beebe et al., 2013; Cottell, et al., 2011; Valente et al., 2011). Healthy People goals are established through science-based information on how to improve the quality of life among the U.S. population. One goal of Healthy People 2020 is to increase the number of older adults receiving chronic disease self-management education, which is program offered through the CMP (HHS, 2020). Furthermore, the CMP helps with managing chronic diseases by providing a well-balanced meal that reflect the principles of the Dietary Guidelines of Americans, to promote health and reduce risk of chronic disease through healthy eating and physical activity.

**Loneliness**

Older adults’ physical and mental health is also adversely affected by loneliness. Cornwell & Waite (2009) define aspects of loneliness including social disconnectedness, as low levels of participation in social activities and the lack of social relationships as well as perceived isolation as a perceived lack of social support and loneliness. The health risks produced by social isolation may be particularly deleterious for older adults as they are more likely to encounter health problems, disabilities and stressful life course transitions that heighten their need for social support (Cornwell & Waite, 2009). Loneliness is associated with worse physical health (Cornwell & Waite, 2009). For example, the older adults who felt more support,
companionship and were socially involved had a 70% chance of indicating their health as “very good” or “excellent”, compared to only 40% for those who reported extreme loneliness (Cornwell & Waite, 2009). Furthermore, loneliness among older adults is associated with limiting diseases such as chronic lung disease, arthritis, impaired mobility, and depressive symptoms (Steptoe, Shankar, Demakakos, & Wardle, 2013). Loneliness can worsen mental health, which is associated with a poor nutritional status among community residing older adults (Yoshimure, Yamada, Kajiwara, Nishiguchi & Aoyama, 2012). For example, 85% of non-isolated older adults reported “good” or “excellent” mental health, compared to 25% for those who felt extreme loneliness (Cornwell & Waite, 2009).

Loneliness is a significant public health concern among older adults with a sizeable proportion of older adults experiencing different types of loneliness (Gerst-Emerson & Jayawardhana, 2015). The nutritional status of older adults can also be influenced by loneliness. For example, 10.6% of older adults at risk for social isolation were malnourished and 37.9% were at risk of malnutrition (Boulos, Salameg, & Gateau, 2016). Similar results were seen in older adults who had feelings of loneliness, with only 29% receiving adequate nutrition and the majority (71%) having a poor nutritional status (Boulos, Salameg, & Gateau, 2016). Loneliness or social isolation can be observed in multiple ways including whether you eat or live alone and if you have a spouse. For example, those who were non-isolated and shared meals with others were malnourished less often than those who were isolated and
ate alone (Boulos, Salameg, & Gateau, 2016). Those who were divorced/single or widowed were one-third less likely to share meals “most of the time” when compared to married older adults and they were seven times more likely to “infrequently or never” share meals (Boulos, Salameg, & Gateau, 2016). The proportion of older adults without a spouse increases with age (AoA et al., 2018). About 21% of men and 34% of women aged 65+ are living alone while about one-half (44%) of women aged 75+ were living alone in 2017 (AoA, et al., 2019). A little less than one-half (40.3%) of older adults who lived alone were at high nutritional risk, compared to only 17.7% of older adults who lived with others (Keller, 2006). Furthermore, Hengeveld and others (2018) reported that older adults who have been living alone had significantly higher rates of protein-energy malnutrition. A stable social network and good mental help can combat feelings of loneliness (Zebhauser et al., 2014).

This is why a key component of the congregate nutrition services is the opportunities for older adults to socialize. Almost all (93%) CMP participants reported being satisfied with their opportunities to spend with other people; 77% indicated no difficulties getting in contact with other people in the past two weeks; and a majority (63%) stated they are a part of social, religious or special interest groups (Mabli et al., 2017). Compared to non-CMP participants, CMP participants were more satisfied with their socialization opportunities (94.0% versus 85.8%) (Mabli et al., 2017). It is
important to recognize this issue and support programs that promote social connections among older adults like the CMP.

**Health Care Utilization**

Health care utilization impacts the nutritional status of older adults too. Malnutrition and hospital utilization have an interacting relationship. Hospitalization leads to significant changes in nutritional status (Rinninella et al., 2019), which can be attributable to the changes in energy needs and reduced intake as a result from poor appetite, dysphagia and nothing by mouth status (Kirkland et al., 2012). Malnutrition is referred to as a skeleton in the hospital closet because it goes undiagnosed, yet is prevalent (Souza, Sturion, & Faintuch, 2015; Kirkland et al., 2012). Kaiser and others (2010) reveal that 39% of older adults in hospitals were classified with malnutrition and 46% were identified as “at risk” in various health care settings; overall two-third of older adults in health care setting were at risk or malnourished. Furthermore, poor nutrition before hospital admission is associated with sarcopenia, depressed immune system, longer hospital stays, higher hospital re-admission rates as well as greater health care costs and long-term patient mortality (Agarwal et al., 2013; Barker, Gout, & Crowe, T. C., 2011; Souza et al., 2015). The CMP is one means of reducing hospitalizations for older adults.

CMP participants have lower rates of hospital admissions, 30-day hospital readmissions, home health episodes and emergency department visits that lead to hospital admission compared to non-CMP participants (Mabli et
Significantly lower rates of health care utilization were only seen among CMP participants with either lower income or lived alone compared to non-CMP participants of similar sociodemographic characteristics, which both factors increase an older adults’ nutritional risk (Keller, 2006; Simsek et al., 2013). This suggests that the CMP can help protect high-risk groups against this health disparity. Similarly, CMP participants also had lower nursing home admission rates compared to non-CMP participants (Mabli et al., 2018). Additionally, the CMP offers opportunities for volunteering and over one-third (39%) of participants assist in volunteer work at the meal site (Mabli et al., 2017). This opportunity to volunteer may have a protective health benefit. Kim and Konrath (2016) reported older adults who volunteer were more likely to stay updated with their health status and spend less nights in the hospital compared to non-volunteers. Volunteering is just one of the multiple ways the CMP helps improve the health of its participants, which many have been noted in this review.

**Summary**

The determinants of nutritional risk among older adults are socioeconomic status, food insecurity, chronic conditions, loneliness and health care utilization. Older adults’ nutrition status and these factors have an interconnected relationship and therefore it is imperative that resources such as the CMP which address these factors and produce positive health outcomes for older adults are valued and recognized in a society with a growing older adult population.
Congregate Meal Program Participation

In Iowa, the CMP is not being utilized by the older adult population. The Iowa CMP participation rate decreased by 46% from 2011 to 2017 (Department on Aging, 2017). In Linn County, the CMP participation rates decreased by 74% in the same time period (Heritage Area Agency on Aging, 2019). Figure 2-1 shows the declining rates of CMP participation in Iowa by age.

Figure 2-1. Congregate Meal Program (CMP) Participation Rates by Year and Age (data.Iowa.gov)
These declining rates are of concern because over the same six-year period, there has been a steady increase in the proportion of Iowa nutrition program participants at high nutritional risk increasing from 17% in 2011 to 25% in 2016 as screen by the DETERMINE tool (Heritage Area Agency on Aging, 2019). Additionally, there is an unmet need due to a majority (89%) of older adults who are food insecure not receiving the congregate nor home-delivered meals through the Nutrition Services Program (Lloyd & Wellman, 2015). The CMP has seen a decline in new participants, with a majority (84%) of participants attending a meal site for over a year and 15% enrolled within the preceding eight months (Mabli et al., 2017).

The decline in participation is impacted by many factors including funding and limited community awareness and support of the program. Federal funding for the CMP is limited and has seen minimal increases despite the growing older adult population (Fox-Grage, & Ujvari, 2014). For example, Federal funding covered 44% of costs in 2015 to support the services administered at the meal site with the remaining costs being paid for through local public and private sources (Lloyd & Wellman, 2015). With limited funding, many communities nationally have had to either close the congregate meal site, establish waiting lists for services, decrease serving days, thus decreasing the number of people served or who are able to participate in the CMP (Lloyd & Wellman, 2015).

This limited funding may be attributable to limited impact data provided by the CMP. The Women, Infants, and Children (WIC) programs is
another Federal food and nutrition program that has continued grow and expand, in part to the outcome data it has provided by using gold standard nutritional risk evaluations (e.g. biochemical and anthropometric data), registered dietitian nutritionists and conducting extensive research on cost-effective investment improving health and nutrition for low-income families through WIC (Carlson, & Neuberger, 2017). Conversely, there has only been two cost-analysis reports conducted for the CMP (in 1996 and 2015) that only included the total costs of the program and not if the program is cost-effective by improving health and nutrition as well as promoting independence among community-residing older adults (Ponza et al., 1996; Ziegler, Redel, Rosenberg, & Carlson, 2015). Furthermore, the CMP lacks multiple extensive research evaluation and reaches less than 2% of the older adult population (60+) (U.S. Census Bureau, 2017; ACL, 2018). Additionally, the tool required nationally to measure the nutritional impact of the CMP, ‘Determine Your Nutritional Health’ checklist (NSI checklist), is an ineffective way to assess nutritional risk (Vieira, Assunção, Schäfer, & Santos, 2016; Brunt, 1999; Sinnett et al., 2010; Beck, Ovesen, & Osler, 1999; De Groot, Beck, Schroll, & van Staveren, 1998; Sahyoun, et al., 1997; Rush, 1993). The CMP also does not require the involvement of professionals in the nutrition field, such as registered dietitian nutritionist, RDN (Saffel-Shrier, Johnson, & Francis, 2019).

Another issue that may be affecting CMP participation rates is limited awareness and support of the services provided through the OAA and the
CMP. Mabli and others (2017) reported that a majority (74%) of CMP participants heard about the program through family, friends, or another person and less than 8% were referred to the program through community-based organization, including hospitals and social workers. Those who interact with health care facilities are the most vulnerable and could benefit the most from the CMP as malnutrition is an under-recognized problem among hospitalized patients (Konturek, Herrmann, Schink, Neurath, & Zopf, 2015). Better promotion of the CMP and its services to both potential participants as well as community groups and health care providers servicing adults age 60 years and older may help prevent further participation decline and potentially help increase participation rates.

**Social Marketing Theory**

The CMP could increase participation rates by ensuring it is meeting the needs and preferences of today’s older adult. One way to do this is by applying the Social Marketing Theory (SMT) which has been used successfully in the design of many nutrition programs for older adults (Francis, Taylor, & Strickland; Francis & Taylor, 2009; Tan et al., 2010; Roy et al. 2016). The SMT is a program planning model that applies marketing principals toward public health programs (Lefebvre & Rochlin, 1997; Storey, Saffitz, & Rimón, 2008). The SMT provides the framework for effectively implementing behavior change for a whole population with the most crucial step of knowing the target population and making sure they are listened to and understood (Lefebvre & Rochlin, 1997; Storey, Saffitz, & Rimón, 2008).
The CMP has a large audience that can benefit from using its services but the CMP needs to be more effective in promoting its services.

The SMT five key principles are: (1) focusing on behavioral outcome, (2) prioritizing consumers’ benefits, (3) maintaining a market perspective, (4) development of proper combination of four strategic elements (product, place, price, and promotion), and (5) identify differences among audience (Lefebvre & Rochlin, 1997; Storey, Saffitz, & Rimón, 2008). Having a market perspective is interpreted as being consumer orientation, or making decisions based on the consumers’ needs and desires, therefore encompassing them in the market (Lefebvre & Rochlin, 1997; Storey, Saffitz, & Rimón, 2008). The consumers within the market are dependent on communication of information, such as what is available, the benefits, and costs as well as where and how to they can be used (Storey, Saffitz, & Rimón, 2008). Another aspect of having a market perspective is competition, and therefore the product must show more value and be viewed more favorably to the consumers than other competing products (Storey, Saffitz, & Rimón, 2008). Furthermore, Andreasen (2006) reveals a strategy to reach different levels of communication called upstream, or the focus on infrastructural change, and downstream, which is focused on individual change. The different levels collaborate so that the barriers from the individuals is acknowledged at the structural level. These principles are utilized in the SMT cyclic model.
The SMT is made up of six steps (Figure 2-2). The first three steps encompass the design stage where an analysis of the market is performed to identify behavior trends, resources available, unique preferences, and personal influence as well as social, cultural and structural factors within the target audience (Storey, Saffitz, & Rimón, 2008). For example, the use of focus groups to obtain this information has been effective with the older adult population (Francis, Taylor, & Strickland, 2004; Hoerr et al., 2016; Roy et al. 2016). This information is used to develop materials that are tested on the target audience to further understand the interactions and influences the
product has with the consumers (Francis & Taylor, 2009; Francis, Martin, & Taylor, 2011; Keane & Francis, 2018; Lee & Kotler, 2011; Roy et al., 2016). The last two stages are in place to improve the product and make it more effective. These stages include process and outcome evaluations to be analyzed for effectiveness of program and to identify areas of improvement (Francis & Taylor, 2009; Francis et al., 2011; Keane, Francis, 2018; Lee & Kotler, 2011; Roy et al., 2016; Tan et al., 2011)

Conclusion

Maintaining independence among older adults is beneficial for not only the individual older adult but society as well. In the face of a growing older adult population it is imperative CMP participation improves to help promote and support older adults physically, mentally and socially. The SMT provides a planning structure that can achieve this by focusing on the needs of older adults to construct a program that directly appeals to the older adult population and provides the resources they need to achieve higher health.

References


CHAPTER 3. METHODOLOGY

Study 1: Congregate Meal Program Needs Assessment

Study design

This non-comparative study examined the needs and preferences of older adults for community food and nutrition programming. This qualitative study utilized four focus group discussions in two Iowa counties (Polk and Linn counties). The study protocol was reviewed by the Iowa State University Institutional Review Board and classified as exempt.

Recruitment

Participants were (1) adults aged 60 years and older or disabled adults younger than 60 years who either live in an older adult housing facility where congregate meals are served, or live with and accompany adults age 60 years and older to the meal site or who serve as meal site volunteers; (2) those who attended the selected Congregate Meal Program (CMP) locations at the time of the study; (3) those residing at the senior apartment involved with the study; and (4) English-speaking. Recruitment strategies were comprised of in-person presentations at congregate meal sites and various apartments that were part of the Housing Choice Voucher Program (previously known as Section 8 housing) in the same area as well as personal invitations from research staff, and email requests. Recruitment efforts targeted CMP locations to recruit subjects who were actively participating in the CMP and senior apartments to recruit subjects who were eligible for the CMP, but were not currently participating in it. The goal was to recruit 5 to 10 participants
per focus group (20 to 40 participants total) per common focus group procedures (Kruger, & Casey, 2009; Rabiee, 2004). A total of 33 older adults were recruited (21= CMP participants, 11= non-CMP participants). No incentives were provided to focus group participants; however, refreshments were served.

**Data collection**

Four focus group sessions were conducted by a research team of five including the first two authors of the study. Three were held at congregate meal sites and one was held at a senior apartment complex. The focus groups were led by research team members trained in focus group facilitation (Dr. Francis and C. Rudolph). Participants completed a 19-question sociodemographic questionnaire including age, gender, race, education attainment, marital status, work status, source of income, transportation, meal purchasing and meal preparation status, self-reported health, diagnosed chronic health conditions, CMP attendance, eating out frequency, and food security (see appendix A, Focus Group Questionnaire). Food security included two validated (sensitivity of 97% and specificity of 83%) questions among low-income families from the Household Food Security Survey (HFSS) (Hager et al., 2010). Focus group questions centered on motivators and barriers for attending the CMP, menu preferences, environmental attributes of restaurants and/or events, and educational programming ideas and activities. The focus groups questions were similar for both groups; however there were a few differences depending on whether the focus group was for CMP participants (see appendix B, CMP Focus Group Questions) or
non-CMP participants (see appendix C, Non-CMP Focus Group Questions).

Table 3-1 lists the focus group questions, with the two different questions asked of the non-CMP participants highlighted. The focus group sessions were audio recorded and followed standard focus group protocol (Kruger, Casey, 2009; Rabiee, 2004).

<table>
<thead>
<tr>
<th>Intention</th>
<th>Participant Type</th>
<th>Specific questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identify <strong>motivators</strong> for attending the CMP.</td>
<td>Non-CMP</td>
<td>What could we do to entice you to choose the CMP over other restaurants and/or meal options?</td>
</tr>
<tr>
<td></td>
<td>CMP</td>
<td>With so many restaurant and meal options around here, what is it about the CMP that keeps you coming back?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>What or who encouraged you to come [to the CMP]?</td>
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<td></td>
<td></td>
<td>What were your initial feelings about the program? In what ways have your feelings changed</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Think about a friend or family member who is age 60 years or older and is not attending the CMP. What would you say to them to encourage them to attend?</td>
</tr>
<tr>
<td>Identify <strong>barriers</strong> for attending CMP.</td>
<td>Non-CMP</td>
<td>You are here today because you don’t participant in a CMP. The local Area Agency on Aging and the Iowa Department of Aging want to better understand why. I’d like to hear more about the things that get in the way or prevent you and your friends from attending the local CMP?</td>
</tr>
<tr>
<td>Identify <strong>ideal CMP attributes.</strong></td>
<td>Both</td>
<td>If you were given the money and the authority to create the perfect meal program for adults age 60+, what would it look like? Who would come? What event would occur? What would keep people coming back?</td>
</tr>
<tr>
<td>Identify meal and food preferences.</td>
<td>Both</td>
<td>Describe the food and/or meal options that would excite you and your friends?</td>
</tr>
<tr>
<td>Identify environmental influences and programming preferences.</td>
<td>Both</td>
<td>Describe factors you take into consideration when choosing a restaurant.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Think about a time you really enjoyed a meal. What about it made it so enjoyable?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Think about the community programs, like a class, seminar, concert, art festival, or any other program you enjoy attending. Describe how you learn about these programming opportunities. What helps you decide whether you attend?</td>
</tr>
<tr>
<td>Identify factors for aging successfully.</td>
<td>Both</td>
<td>In addition to the meal, the CMP also provides an opportunity to learn. What topics are you passionate about? What types of programs/learning opportunities would you like to see offered? How would these programs look to you?</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Describe how aging successfully looks and feels? What do you or others who are age 60 and older need in order to accomplish this?</td>
</tr>
</tbody>
</table>

**Data analysis**

The audio recordings were transcribed verbatim by a member of the research team who was not in attendance of the focus groups (N. Kling). All team members were trained in theme analysis by Dr. Francis. The transcriptions were reviewed by each research team member independently who analyzed them for themes using the standard focus group protocol (Kruger & Casey, 2009; Rabiee, 2004). The research team then met together for further theme analysis (i.e., identifying, charting, and interpreting) while using standard focus group protocol (Kruger & Casey, 2009; Rabiee, 2004).
Consensus on themes for each question was achieved among the research team using framework analysis (Rabiee, 2004). Sociodemographic data were analyzed via IBM Statistical Package for the Social Sciences (SPSS), version 24.0 using descriptive statistics. To determine whether there were differences among sociodemographic characteristics between groups (i.e., CMP participants versus Non-CMP participants) a chi-square analysis was done.

**Study 2: Linn County Innovations in Nutrition Program Impact Study**

**Introduction**

The impact study was a comprehensive assessment of the CMP. This entailed a program awareness and utilization assessment, program satisfaction survey, and a CMP program evaluation. Therefore, the methods described here are separated by each component of the *Linn County Innovations in Nutrition Program (LCINP)* Impact study. Each study protocol was reviewed by the Iowa State University Institutional Review Board and classified as exempt.

**Intervention Description**

The *LCINP* intervention included extensive advertising techniques and the implementation of Encore Café at three Congregate Meal Program (CMP) sites. Collaborations with the Heritage Area Agency on Aging and community partners including the City of Marion, Marion Public Library, City of Central City, Marion Parks and Recreation Department, Hy-Vee Grocery of Marion, Marion Economic Development, Marion Chamber of Commerce, Marion Times Newspaper, St. Mark’s United Methodist Church,
Hawkeye Area Community Action Program (HACAP) food reservoir, and local YMCA were crucial to the project. These community partners aided by donating space, and advertisement for the Encore Café. Advertisement reflected preferred marketing routes identified in Study 1, which were free local print media, word of mouth and television. Advertisement for Encore Café included four billboards, 34 news stories on local television stations, one feature article in the regional newspaper, weekly menus in two local newspapers, and one ValPak coupon mailed to 50,000 residents in the area.

Study 1 also noted a desire for fresh produce/salad bar and having a variety and choice within the meals. In response the Encore Café outsourced the meal production to a local grocery store. The store provided a daily salad bar, two hot menu options with sides, and beverages (e.g. milk, coffee, iced tea, and water with lemon). The chosen tag-line for the Encore Café was, “a second call to enhance your health,” which supports the CMP attendance motivators identified in Study 1. Furthermore, some evidence-based programs were offered at Encore Café meal sites including Matter of Balance, Chronic Disease Self-Management Program, and Water Aerobics for Arthritis.

Program Awareness and Utilization Assessment

Study Design

This two-part study assessed community partner’s program awareness of Heritage Area Agency on Aging (Heritage) program offerings using a POST-PRE survey design and the Heritage program utilization by older adults.
Participants

The awareness survey participants were members of the LCINP Grant Advisory Committee. This committee was appointed by the Project Director (T. Getty). They met regularly to discuss the Innovations project. The utilization study included Heritage program participants from 2017 to 2019 (two years). This information was collected regularly by the Heritage staff using the Wellsky data software.

Data Collection

In Fall 2018, the Project Director distributed the seven-question awareness surveys to advisory committee members; eight surveys were returned (Appendix D). Questions included reporting their occupation, years at current position, awareness of other Heritage programs offerings, number of CMP program referrals and their likelihood of referring clients to the CMP. Respondents were asked to rate their awareness of the 14 Heritage programs before the Innovations project (before November 2017, PRE) and after one year of the innovations project (after September 2018, POST,) using a five-point Likert scale (1= “very low” and 5= “very high”). The maximum total awareness score was 70. Respondents also rated their likelihood of referring an older adult to the CMP and other Heritage programs using a five-point Likert scale (1=“very unlikely” to 5=“very likely”) at PRE and POST.

Program utilization data was collected via the Wellsky data software. Participants reserved their meal at least 24-hours prior to the meal time by calling the Encore Café or signing up on-site. This information is sent to meal site staff where they scan the barcodes that is documented through Wellsky.
Data Analysis

Awareness data were analyzed using the IBM Statistical Package for the Social Sciences (SPSS), version 25.0. Descriptive statistics were used to assess sociodemographic data and total program awareness at PRE and POST. Change in total awareness was determined using paired sample t tests. Change in awareness by program offering was analyzed via the Wilcoxon Signed Rank test. Program utilization frequencies were calculated using Wellsky; assessment of change was not possible with these data.

Program Satisfaction

Study Design

This cross-sectional study assessed satisfaction of CMP participants at three Innovation meal sites and one Traditional meal site in Fall 2018 (PRE, n=73) and Fall 2019 (POST, n=63).

Recruitment

CMP participants for the study were approached as they entered the meal sites and asked to fill out the satisfaction survey. Participants were told that the survey was optional and part of a pilot and implementation grant for the CMP. Additionally, the opportunity to fill out the survey was voiced during group announcements. The survey was portrayed as an opportunity to shape new services for current and future CMP participants and that their feedback was valued and necessary for the success of the CMP.

Data Collection

Participants at each meal site completed a 14-question survey (Appendix E). Surveys were distributed by the Project Director and CMP
meal site managers. Surveys took about 15 minutes for respondents to complete. Surveys included questions pertaining to sociodemographic information, CMP usage, in addition to satisfaction questions. The satisfaction questions were broken down into two subcategories: Food Satisfaction (9 questions; 36 points) and Dining Satisfaction (6 questions; 24 points). Respondents rated their frequency of satisfaction with various attributes using a five-point Likert scale (0 = “never,” 4 = “Always”). Total satisfaction was calculated by adding the two subcategories for a maximum of 60 points. The total satisfaction score was categorized into five categories: very satisfied (49-60 points), more than satisfied (37-48 points), satisfied (25-36 points), partly satisfied (13-24 points), and not at all satisfied (≤ 12 points).

The CMP impact on respondent’s health was also assessed in four areas including: (1) helping them eat healthier, (2) gaining nutrition and wellness knowledge, (3) helping them remain in their home, and (4) improving their health. Respondents rated their agreement with the corresponding statements using a five-point Likert scale (1 = “strongly disagree,” 5 = “strongly agree”). The maximum health impact score was 20 points.

**Data Analysis**

Statistical analyses were performed using IBM SPSS. Descriptive statistics were used to assess sociodemographic data, reasoning for attending CMP, and total satisfaction score category at PRE and POST. Satisfaction scores were only computed for respondents who filled out each question.
within the section. Between group differences were assessed using an Analysis of Covariance (ANCOVA) at PRE and POST as well as difference between the three Innovation sites. Since respondents were not followed from PRE to POST the sample was different and changes within the groups by time could not be assessed. The covariates at PRE, were age, education, living situation, marital status, weekly meal program attendance and overall CMP attendance length. At POST, the covariates were weekly CMP attendance and overall CMP attendance length. Additionally, the relationships between sociodemographic data, satisfaction scores (subcategories and total satisfaction) and the health impact score at POST were examined using Pearson Correlation.

**CMP Evaluation**

**Study Design**

This quasi-experimental study examined the impact of CMP participation on nutritional risk, dietary intake, loneliness, food security, and hospitalizations over six months.

**Recruitment**

There were three groups: (1) Innovation, congregate meal sites taking part in the innovations grant in Linn County (n=3), (2) Traditional CMP, congregate meal site in Jones County receiving the traditional meal service (n=1), and (3) Comparison, older adults who are not attending a congregate meal program (n=3 senior apartment complexes) in Story County. The participants in the Innovations and Traditional groups were recruited by personal invitation of the Innovations grant team in Linn and Jones counties.
The apartments included in the Comparison group were contacted via email by Dr. Francis. The complex contact person (Head nurse or social worker) invited residents to take part.

**Data collection**

Respondents completed a nine-page questionnaire comprised of validated tools that assessed healthy eating self-efficacy, loneliness, nutritional risk, dietary intake frequencies, food security, and general sociodemographic characteristics at three time periods (Baseline [Month 1], mid [12-weeks], and post [24-weeks] (Appendix F). Only the respondents who completed the questionnaire at baseline were asked to complete a mid- and post-questionnaire. Respondents in the Innovations and Traditional groups received small gifts (valued at <$5) at each data collection visit. Respondents in the Comparison group received $5 and a small gift (valued at <$5).

**Sociodemographic data**

Sociodemographic questions inquired about age, race, living situation, income, self-reported health, hospitalizations, and community support. Respondents also rated their health status using a five-point Likert scale (1= “very poor,” and 5= “very good”).

**Healthy Eating Self-Efficacy Scale (HESES)**

The HESES assesses one’s self-efficacy (confidence) in being able to overcome various barriers to establish healthy eating habits (Schwarzer & Renner, 2000). This scale is validated with a goodness of fit Index: 0.98; root mean square (RMS): 0.059, RMs error of approximation: 0.3) (Schwarzer &
The HESES asks participants to rate their likelihood making diet changes under five different situations using a 5-point Likert Scale (1 = “Very uncertain,” 4 = “Very certain”). The total score is averaged to a maximum of 4 points. A higher total score indicates higher self-efficacy in overcoming barriers and carrying out nutritional modifications.

**De Jong-Gierveld (DJG) Loneliness Scale**

The DJG Loneliness scale is a validated six-item tool that is validated with α-coefficients between .70 and .76, among the older adult population (de Jong-Gierveld, & van Tilburg, 2006; Penning, Liu, & Chou, 2014). This scale assesses emotional loneliness (3 questions) and social loneliness (3 questions). Loneliness is a personal feeling that is derived from evaluating one’s state in the environment, which could include having an undesirable amount of relationships with friends, family or colleagues (social loneliness) or lacking intimate relationships with people that one can confide in (emotional loneliness) (de Jong-Gierveld, & van Tilburg, 2006; Penning et al., 2014). Respondents answer either “Yes”, “More or less” or “No” for each question. The first 3 questions for emotional loneliness are worded negatively and therefore, a neutral (“More or less”) or a positive (“Yes”) answer will have a score of 1. The last 3 questions for social loneliness are worded positively and therefore, a neutral or negative (“No”) answer will have a score of 1. A higher the score indicates more loneliness with the highest score being 6 total or 3 for each subgroup. (Penning et al., 2014).
**Dietary Screening Tool (DST)**

Nutritional risk and dietary intake frequencies were assessed using the DST (Bailey et al., 2007; 2009). The DST has been compared to other valid dietary assessment tools including Healthy Eating Index (HEI) and mean Adequacy Ratio (MAR), which use data from multiple 24-h dietary recalls and showed 83 percent sensitivity, 75 percent specificity, and 79 percent accuracy level (Bailey et al., 2009). The DST is composed of a food frequency questionnaire that places more value on responses that correlate with higher diet quality (Bailey et al., 2009). The points are allotted to several dietary components that align with the HEI and the value is determined by the number of questions in each category. Of the 24 questions, 5 are ‘yes’ or ‘no”, 18 are based on consumption frequency, and 1 question asked about the usage of a multi-vitamin (e.g. Centrum). The total score (maximum =100) is categorized into three nutritional risk classifications, ‘at-risk’ (DST score <60), ‘possible risk’ (DST score 60-75), and ‘not at risk’ (DST score >70). To aid data analyses, dietary intake frequency scores (DIF) were categorized into “low”, “moderate”, or “high” based on work by MacNab and others (2018) (Table 3-2).

**Food Security**

Food security was assessed using the validated (sensitivity of 97% and specificity of 83%) Two-Item Household Food Security Survey (HFSS) (Hager et al., 2010).
Table 3-2: Dietary Intake Frequency (DIF) Categories

<table>
<thead>
<tr>
<th>DIF Categories</th>
<th>Maximum Points</th>
<th>“Low”</th>
<th>“Moderate”</th>
<th>“High”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dairy</td>
<td>10</td>
<td>0-5</td>
<td>--</td>
<td>6-10</td>
</tr>
<tr>
<td>Lean protein</td>
<td>10</td>
<td>0-5</td>
<td>--</td>
<td>6-10</td>
</tr>
<tr>
<td>Vegetables</td>
<td>15</td>
<td>0-5</td>
<td>6-10</td>
<td>11-15</td>
</tr>
<tr>
<td>Total and whole grains</td>
<td>15</td>
<td>0-5</td>
<td>6-10</td>
<td>11-15</td>
</tr>
<tr>
<td>Whole fruit &amp; juice</td>
<td>15</td>
<td>0-5</td>
<td>6-10</td>
<td>11-15</td>
</tr>
<tr>
<td>Processed meat</td>
<td>10&lt;sup&gt;a&lt;/sup&gt;</td>
<td>6-10</td>
<td>--</td>
<td>0-5</td>
</tr>
<tr>
<td>Added fats, sugars, and sweets</td>
<td>25&lt;sup&gt;a&lt;/sup&gt;</td>
<td>16-25</td>
<td>11-15</td>
<td>0-10</td>
</tr>
</tbody>
</table>

<sup>a</sup> A higher value for processed meats and added fats, sugars, and sweets reflects a lower intake because of the lack of nutrients in these food products; this is desirable.

Data analysis

Only respondents who filled out the questionnaire at both PRE and POST were utilized in the analysis. MID questionnaires were not included. Given the low response rate of the Traditional group (n=5, 25%), all data analyses were limited to only the Innovations and Comparison group respondents. Two respondents in the Comparison group reported attending a meal program or receiving meals on wheels and therefore were excluded from the rest of the data analysis. Thus the total sample size was 47 participants (Innovations = 26, Comparison = 21). Data analysis was conducted using the IBM Statistical Package for the Social Sciences (SPSS) version 25.0. Descriptive statistics analyzed self-efficacy, loneliness, nutritional risk (DST score), dietary intake frequencies, food security, and sociodemographic variables. Change scores for all outcome variables were
calculated (POST scores minus PRE scores). Chi-square tests were used to
determine baseline differences between groups for the sociodemographic
variables (i.e. age, gender, race, education, marital status, health status,
income source, and living arrangements). Within group changes for total
DST score, dietary intake frequencies, total loneliness, social and emotional
loneliness, and average healthy eating self-efficacy from PRE to POST were
assessed using paired sample t-tests. Living arrangement significantly
differed between groups at PRE, therefore analysis of covariance
(ANCOVA) was used to determine any between group differences for our
outcome variables (i.e., total DST score, dietary intake frequencies, total
loneliness, social and emotional loneliness, and average healthy eating self-
efficacy) while controlling for living arrangement.

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CHAPTER 4. CONGREGATE MEAL PROGRAM NEEDS AND PREFERENCES ASSESSMENT

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Introduction

Community food and nutrition programs offer benefits to maintaining independence among community-residing older adults. With the older adult population being the fastest growing age segment in the United States (Administration on Aging [AoA], Administration for Community Living [ACL], & U.S. Department of Health and Human Services [HHS], 2018), promoting these programs is advantageous. This age group is expected to double by 2060 (AoA et al., 2018). In addition, the population aged 85 years old and over is predicted to increase by 129\% by 2040 (AoA et al., 2018). The growing older adult population raises concerns regarding health care spending. In 2014, older adults accounted for 13\% of the U.S. population but contributed to 33\% ($51.3 billion) of the total annual costs of disease-associated malnutrition (Snider et al., 2014). Providing community-based food and nutrition programs is essential for the health and independence of the older adult population.
The Older Americans Act (OAA) community food and nutrition programs are one approach toward providing these services. The Congregate Meal Program (CMP) is part of the Nutrition Services funded through the OAA. The CMP has resulted in maintaining older adult independence, improving their nutritional intake, and lowering food insecurity rates (Mabli et al., 2017). CMP participants report high program satisfaction, and opportunities for socialization as well as believe the program makes them feel better (Lloyd & Wellman, 2015; Mabli et al., 2017).

Despite the documented benefits and program satisfaction (Lloyd & Wellman, 2015; Mabli et al., 2017), CMP participation rates are declining (ACL, 2017). Nationwide there has been an 8% decline in CMP participation since 2011 and in Iowa, there has been a 46% decline (ACL, 2017). The urban Iowa county, Linn County, has experienced a 74% decline in CMP participation (Heritage Agency on Aging, 2019). In addition, the percentage of CMP participants classified as “at high nutritional risk” has gradually increased over the same period (ACL, 2017). The declining participation rates and increase nutritional risk of participants convey a need to determine how to best serve older adults through the CMP. Participation has been noted an individual and situational experienced for a population (Abelson, 2001; Campbell and McLean, 2002; Cornwall, 2008; Draper & Freedman, 2010; Kenny et al., 2013; Titter, & McCallum, 2006).

The Social Marketing Theory (SMT) has been effective among the older adult population by using specific feedback from the target population
for the program planning model (Francis, Taylor, & Haldeman, 2009; Francis, MacNab, & Shelley, 2014; Roy et al., 2016). The SMT revolves around the idea of knowing the target population and ensuring the population is listened to and understood to create a desired behavior change for a whole population (Lefebvre & Rochlin, 1997; Storey, Saffitz, & Rimón, 2008). The six stages of the SMT cyclic model are (1) planning and strategy, (2) selecting channels and materials, (3) developing materials and pretesting, (4) implementation, (5) assessing effectiveness, and (6) feedback to refine program. The first three stages encompass obtaining information from the target population such as unique preferences and personal influences, which will then be implemented and assessed for effectiveness in the last stages (Lefebvre, & Rochlin, 1997; Storey, Saffitz, & Rimón, 2008). Many have successfully completed the first stages through the use of focus group among the older adult population (Francis, Taylor, & Strickland, 2004; Hoerr et al., 2016; Roy et al. 2016). Utilizing the first stages of the SMT can provide necessary information from CMP participants and potential participants that can assist administrators in revising the program to better meet the needs and preferences of its target audience.

This study focused on SMT Step 1, planning and strategy. The aim of this study was to conduct a qualitative focus group design to understand how to improve the CMP for current participants and increase the appeal for potential participants by answering these following research questions: (1) What factors influence an older adult’s decision to attend the CMP including
motivators, barriers and environmental attributes? (2) What meal preferences are perceived as appealing? (3) What is the desired structure for program/events and topic interests? (4) What are preferred marketing route? (5) What is needed for older adults to age successfully in their communities?

Methods

Study design

This non-comparative study examined the needs and preferences of older adults who both attend the CMP (n=21) as well as non-CMP participants (n=11). The study protocol was reviewed by the Iowa State University Institutional Review Board and classified as exempt. No incentives were provided to focus group participants; however, light refreshments were served during the session.

Participants

Four focus group sessions were conducted at three congregate meal sites and one senior apartment complex. Recruitment strategies included in-person presentations at congregate meal sites and various apartments that were part of the Housing Choice Voucher (previously known as Section 8 housing) program in two Midwest urban counties, as well as personal invitations, and email. The goal sample size was 20 to 32 participants (5-8 participants/focus group); overall 33 participants attended the focus groups. This number of participants was determined to be sufficient to identify common themes (Krueger & Casey, 2000).
**Data collection**

All participants ($n=33$) completed a sociodemographic questionnaire with 19 questions including age, gender, race, education attainment, marital status, work status, source of income, transportation, purchasing and preparation status for meals, self-reported health, diagnosed diseases, CMP attendance, eating out frequency, and food security. Food security was assessed using the two questions validated by Hager and others (2010). Each CMP focus group was facilitated by S. Francis, while the non-CMP focus group was facilitated by another trained research team member. Additionally, a note-taker was present to report non-verbal forms of communication (e.g. head nodding). Questions asked by the facilitator for discussion were aimed to answer the research questions. Focus group questions for CMP participants and for non-participants are presented in Table 4.1. Standard focus group protocol was followed, which included the focus groups being audio recorded and transcribed verbatim by a member of the research team who was not in attendance of the focus groups (Rabiee, 2004, Krueger, & Casey, 2000).
Table 4-1. Focus Group Questions

<table>
<thead>
<tr>
<th>Intended goals</th>
<th>Audience (CMP participants, Non or All)</th>
<th>Specific questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identify <strong>ideal CMP attributes.</strong></td>
<td>All</td>
<td>If you were given the money and the authority to create the perfect meal program for adults age 60+, what would it look like? Who would come? What event would occur? What would keep people coming back?</td>
</tr>
<tr>
<td>Identify <strong>meal and food preferences.</strong></td>
<td>All</td>
<td>Describe the food and/or meal options that would excite you and your friends?</td>
</tr>
<tr>
<td>Identify <strong>environmental influences and programming preferences.</strong></td>
<td>All</td>
<td>Describe factors you take into consideration when choosing a restaurant.</td>
</tr>
<tr>
<td>Identify factors influencing <strong>successful aging.</strong></td>
<td>All</td>
<td>Describe how aging successfully looks and feels? What do you or others who are age 60 and older need in order to accomplish this?</td>
</tr>
<tr>
<td>Identify <strong>motivators</strong> for attending the CMP.</td>
<td>CMP participants</td>
<td>Think about the community programs, like a class, seminar, concert, art festival, or any other program you enjoy attending. Describe how you learn about these programming opportunities. What helps you decide whether you attend? What or who encouraged you to come [to the CMP]? What were your initial feelings about the program? In what ways have your feelings changed? Think about a friend or family member who is age 60 years or older and is not attending the CMP. What would you say to them to encourage them to attend?</td>
</tr>
<tr>
<td>Identify <strong>barriers</strong> for attending CMP.</td>
<td>Non-CMP participants</td>
<td>Think about a time you really enjoyed a meal. What about it made it so enjoyable? You are here today because you don’t participate in a CMP. The local Area Agency on Aging and the Iowa Department of Aging want to better understand why. I’d like to hear more about the things that get in the way or prevent you and your friends from attending the local CMP?</td>
</tr>
</tbody>
</table>
**Data analysis**

Theme analysis was conducted using standard focus group protocol (Rabiee, 2004; Krueger & Casey, 2000). The transcripts were reviewed by five trained research team members individually for theme analysis. Following this, the research team came together for further theme analysis (identifying, charting, and interpreting). Consensus on themes for each question was achieved among the research team using the framework analysis (Rabiee, 2004). Sociodemographic data were analyzed via the IBM Statistical Package for the Social Sciences (SPSS) version 25.0 using descriptive statistics. Chi-square tests were used to assess between group differences (CMP versus non-CMP) for sociodemographic data.

**Results**

**Participants**

All participants were white. Most were educated (75.8% some college or higher), female (72.2%), retired (78.8%), and aged 71 to 80 years old (53.1%) (Table 4.2). The majority used a personal vehicle (84.4%) for transportation; however those in the non-CMP group reported a higher reliance on friends and public transport ($p=.003$). Over three-quarters (84.4%) reported Social Security as their main income source and almost all were food secure (93.8%).
Table 4-2. Focus group participants’ sociodemographic characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Overall (n=33)</th>
<th>CMP (n=21)</th>
<th>Non-CMP (n=11)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number (n)</td>
<td>Percent (%)</td>
<td>Number (n)</td>
</tr>
<tr>
<td><strong>Age (in years) (n=32)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than 60</td>
<td>2</td>
<td>6.3</td>
<td>1</td>
</tr>
<tr>
<td>60 to 70</td>
<td>7</td>
<td>21.9</td>
<td>6</td>
</tr>
<tr>
<td>71 to 80</td>
<td>17</td>
<td>53.1</td>
<td>10</td>
</tr>
<tr>
<td>81 and older</td>
<td>6</td>
<td>18.7</td>
<td>3</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>24</td>
<td>72.2</td>
<td>14</td>
</tr>
<tr>
<td>Male</td>
<td>9</td>
<td>27.3</td>
<td>7</td>
</tr>
<tr>
<td><strong>Marital Status</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single, Never Married</td>
<td>6</td>
<td>18.8</td>
<td>3</td>
</tr>
<tr>
<td>Married</td>
<td>8</td>
<td>25.0</td>
<td>6</td>
</tr>
<tr>
<td>Divorced</td>
<td>5</td>
<td>15.6</td>
<td>4</td>
</tr>
<tr>
<td>Widowed</td>
<td>13</td>
<td>40.6</td>
<td>8</td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High School or less</td>
<td>8</td>
<td>24.2</td>
<td>5</td>
</tr>
<tr>
<td>Technical training or some College</td>
<td>13</td>
<td>39.3</td>
<td>8</td>
</tr>
<tr>
<td>Bachelor’s Degree or Higher</td>
<td>12</td>
<td>36.4</td>
<td>8</td>
</tr>
<tr>
<td><strong>Transportation (n=32)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Personal Vehicle</td>
<td>5</td>
<td>15.6</td>
<td>-</td>
</tr>
<tr>
<td>Other</td>
<td>5</td>
<td>15.6</td>
<td>-</td>
</tr>
<tr>
<td><strong>Food Security Classification (n=32)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Food Secure</td>
<td>30</td>
<td>93.8</td>
<td>20</td>
</tr>
<tr>
<td>Food Insecure</td>
<td>2</td>
<td>6.3</td>
<td>1</td>
</tr>
</tbody>
</table>

a Participants chose more than one option
*Significant difference between groups with p=.003

Over one-third reported their health status to be ‘very good’ (37.5%)

(Table 4.3). Over one-half (53.1%) reported having a diagnosis related to cardiovascular disease (e.g., heart attack, high blood pressure and/or high blood cholesterol). Many (62.5%) reported they planned, prepared and served nutritious meals independently. The majority (61.9%) of CMP participants
were involved in volunteering, whereas 54.5% of the non-CMP participants were not volunteering; this difference was not significant.

**Perception of “Successful Aging”**

Socialization, remaining independent, and being engaged either mentally, or physically in the community were identified as key aspects of an older adult who is aging successfully. Participants explained from personal experience, “…the older you get the more isolated you get, especially if your family moves away or your neighbors move and you either stay or move into some new area.” When asked what they needed to overcome isolation, participants described community activities and interaction with other older adults. One participant stated, “…having planned activities and [meetings] kind of helps…” Another remarked, “[Successful aging means] that we get out in the community… and interact with other people our age.” Additionally, a participant commented, “I think one good thing is to stay active and help and volunteer….” In addition to socialization, maintaining one’s health was also an identified component of successful aging. Some of the comments made illustrating this included: “I think [for] successfully aging [to occur] you have, if you have your health, you have everything.”; “At our age, to be able to do things we, you know, to be able to do thing on our own and kind our mind alert. Keep busy.”
Table 4-3. Food behaviors and health of focus group participants (n=32)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Overall (n=32)</th>
<th>CMP (n=21)</th>
<th>Non-CMP (n=11)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number (n)</td>
<td>Percent (%)</td>
<td>Number (n)</td>
</tr>
<tr>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
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<td>6</td>
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<td>4</td>
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<tr>
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<td>8</td>
<td>25.0</td>
<td>4</td>
</tr>
<tr>
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<tr>
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<tr>
<td><strong>Meal Preparation</strong></td>
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<td></td>
</tr>
<tr>
<td>Independent</td>
<td>20</td>
<td>62.5</td>
<td>12</td>
</tr>
<tr>
<td>If supplied ingredients</td>
<td>3</td>
<td>9.4</td>
<td>2</td>
</tr>
<tr>
<td>Can heat and serve</td>
<td>2</td>
<td>6.3</td>
<td>2</td>
</tr>
<tr>
<td>Can prepare but does not</td>
<td>4</td>
<td>12.5</td>
<td>3</td>
</tr>
<tr>
<td>maintain nutritious diet</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Can prepare but choose not to</td>
<td>2</td>
<td>6.3</td>
<td>1</td>
</tr>
<tr>
<td>Need assistance</td>
<td>1</td>
<td>3.1</td>
<td>1</td>
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<td><strong>Volunteering Status</strong></td>
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<tr>
<td>10-20 hours weekly</td>
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<td>15.6</td>
<td>5</td>
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</table>
Despite the focus on independence, many did acknowledge that help from others may be needed, “[we need] to admit we need help.” In order for an older adult to age successfully support systems including family, friends, having someone who cares, and aging resources in community as well as having access to health care, financial security, community activities for older adults, and reliable, accessible transportation were all main themes that emerged (Figure 4-1).

**Figure 4-1. Factors Influencing Successful Aging**

**CMP Perceptions**

Respondents described the target CMP audience as single older adults and those who are in need, but overall anyone 60 years and older. One said, “You. You. You” while pointing to others in the room. One replied, “Anybody that wanted to.” Another said, “I know that we [CMP participants], the reputation we have is this is for poor people and
that’s not true. It’s for anybody who is 60 and older.” Respondents shared that their initial feelings of the CMP were negative and included low expectations of the CMP and feelings of nervousness. One stated, “I had a lot of fear... I remember the first day I came here, I was standing in that doorway over there and looking around, and there’s all these people and I’m going oh my gosh, now what do I do?” However, after attending the CMP, participants had exceeded expectations and felt welcomed or included at the meal site. For example, one participant stated, “You feel like family when you come here” while another one commented, “...you feel important, [like] you are not taking advantage of a free meal [and] you feel welcomed.”

Motivators and Barriers for CMP Attendance

Figure 4-2 illustrates the motivators for CMP attendance. CMP participants voiced socialization, affordability, access to healthy meal and the location of the meal site including whether it is accessible with various forms of transportation, as main motivators for attending the CMP.

Similarly, non-CMP participants stated price and socialization as the only motivators for attending the meal site. When CMP participants were asked to reflect on why they decided to go to a meal site friends, family, and advertisement were the main reasons. The routes CMP participants heard about the CMP were on the television, newspaper, brochure, radio, Facebook and through word of mouth. One commented how they saw it advertised multiple times before they decided to attend, “It had been in the newspaper. I do believe [they were] announcing it and [it] kind of went the way of the world and then I was reminded again by [a local station], but it was in the ‘what to do
today’ in the newspaper again." Others had past family members that attended or had neighbors that recommended they come including, “... they [mom and dad] started coming here [CMP], and they just loved it.” and, “I had a neighbor that encouraged me to come, and she had a friendly friend that encouraged them to come.”

Non-CMP participants responded that a major barrier for CMP attendance was the lack of awareness of a nearby congregate meal site. One commented, “I didn’t know they had it anymore.” Another replied “I never heard of [it] any anymore.” Another barrier was a lack of understanding of what was needed to participate as demonstrated by one participant who said, “...it sounded like you had to do all this stuff to qualify. I didn’t understand all of it...” Other barriers including not having reliable transportation and not feeling the need to participate because they were able to prepare food at home.
themselves. One stated, “I figured as long as I’m able to do my own fixing of my own food at home I don’t need to go just yet.”

**Ideal CMP Characteristics**

**Meal preferences**

The ideal CMP themes were having food options for a more individualized meal, having a choice of various activities and a facility that offered a positive, welcoming ambience. These same themes were also reported for how to keep participants coming back. More specifically, the ideal foods and meals were having alternative food options for special diets (e.g., diabetes, renal, heart healthy) as well as having salad bars and offering a variety of foods. One commented, “Providing foods that were appropriate for someone with anything with their health, kidneys, or diabetes. They would feel, oh, okay the foods are going to be safe for me to eat.” Having a variety of food was suggested as not having the same meat and potatoes, one stated, “But you know try different things and different options. I always think about our food here in the Midwest, we are so meat and potatoes but we all love it, let’s face it. But different options are good too.” Prominent factors that influence meal enjoyment included the people present, the conversation, and not having to prepare the meal as well as the meal experience being relaxing and consuming good food. For example, one said, “I enjoy big family meals too. Like, and I don’t do any cooking anymore.”

**Environmental attributes**

We also explored the factors influencing the respondents’ decision to choose to dine at one place over another. This was intended to inform the type of environment the CMP should be held in. These factors were the cost, cleanliness, having a peaceful...
atmosphere, proximity and the food quality. Many of these factors were just listed off including, “Cleanliness.”, “Where it is located.” and “I consider how much it’s going to cost, I always do, I’ve always had to.” Additionally, having a quiet and peaceful environment was appealing, one commented, “I just want peace and quiet.” Another replied explaining the reasoning behind wanted to quiet place, “More like a friendly get together, where you can be with your friends and talk among yourselves.”

Preferred programing ideas

Ideal learning programs and events offered through the CMP were field trips, general educational programs, health promotion and hobby-related activities. The specific topics voiced for educational events were history, technology and nutrition/cooking. The main hobbies older adults wanted to learn more about were photography, crafting, gardening and games. Overall, participants wanted to have something for everyone to enjoy. One stated, “There was something there for everybody, which they do here too, but you want to feel like you’re part of something.”

Preferred programming structure were having them be expert-led, group-based presentations (e.g. series of presentation sessions for one topic, build on each week), age appropriate and having them planned around meal schedule. One suggested, “... [You] could break it down according to what it is [skill/topic]. And/or they could have a short deal on just basic information [on a topic/skill] and question and answers. And let the experts kind of tailor this.”

CMP Program Promotion

The ways in which this sample of older adults reporting learning about community-based programs, events or activities were word of mouth, free local print media and the television. One stated, “T.V., word of mouth would be good...just knowing
form other people that have been to the same place and that had a good interaction and they want to go back.” CMP participants stated they would emphasize cost, good and healthy food, opportunity to socialize and offering to take newcomers so they were not alone as a way to encourage non-CMP participants to come to the meal site. One stated, “Well not only that [invite them to sit at your table] but then we will show them the ropes too.” There was a discussion on how there is no bus system to get to people and one said, “I will volunteer to take someone if they can’t make it here on their own, you know, because there isn’t a bus service.” Another thought socialization was key and stated, “Because it is not fun to just sit in your house.”

Both groups were asked what influenced their decision to attend community events in order to get a general idea of what information should be considered when promoting the CMP. Factors that influenced both groups for attending an event in the community were similar to the motivators for attending the CMP including cost, location, and accessibility, which includes transportation and the layout of the facility or areas (e.g. bathrooms, parking), as well as social encouragement from friend or family. One stated, “Well I go if it’s an event and my family asks me to go.”

Limitations

The generalizability of our findings is limited due to the relatively small and non-diverse sample. Our sample was mostly white women who were food secure thus these findings may not be applicable toward people of color, men or those who are food insecure. In addition, the convenience-based recruitment methods may have resulted in the inclusion of older adults who are more vocal and/or passionate about nutrition, health, and community food and nutrition programs. Moreover, in discussion with more vocal participants, the voice of others may have been minimized.
Discussion

This study provides insight on how we can improve the CMP to be a community-nutrition program that is valued by its participants and the community. The CMP has remained essentially the same since it started operating in 1965 nationwide. The declining participation rates is likely attributable in part to today’s older adult population being different from previous older generations. The National Institute for Health (NIH) states that this new older adult population is more active with seeking health care and answers for achieving wellness (2017). This is different from the past older adult population that accepted chronic diseases and the consequences of them as a result of aging (NIH, 2017). The majority of identified successful aging factors were also identified as motivators for attending the CMP (i.e. affordability, accessibility, healthy meal and socialization). These factors are reflective of aging research that has also reported enablers for successful aging being accessibility (e.g., access to food, transportation, information), affordability, social support, and living accommodations (Sylvie, Jiang, & Cohen, 2013; Jiang et al., 2017). Research indicates the leading successful aging factor is being engaged (Cosco et al., 2013; Rossen, Knafl, & Flood, 2008; Tkatch et al., 2017; Troutman-Jordan, & Staples, 2014) while the second leading factor is independence (Cosco et al., 2013). The CMP reflects a service that helps older adults age successfully because it promotes socialization, a healthy meal, and health promotion activities; all of which were identified as motivators for attending the CMP. Hoerr and others (2016) reported similar CMP attendance motivators amongst non-CMP participants (e.g., socialization, variety of food, not having to cook, and a variety of learning activities). Similarly, Lee and Gould (2012) reported having activities at the
meal site, available transportation and a welcoming culture as top factors impacting an older adults’ perceived control on whether they attend the CMP. Additionally, they want educational programs that help them staying healthy. Despite healthy meals and activities being desired by this population, the word “healthy” should be used cautiously due to the ambiguous meaning among older adult population (Rudolph, 2019).

Regardless of the many CMP attendance motivators, we need to understand the participation barriers in order to devise strategic marketing strategies. For our sample, participation barriers centered on a lack of awareness and a lack of perceived need. Another barrier identified by Hoerr and others (2016) for another group of Iowans reported the perception of the CMP as unwelcoming as a barrier for attending the CMP among non-CMP participants. Marketing should utilize preferred marketing strategies with free local print media and word of mouth with the general population, including adult children to reinforce social encouragement, which was stated as a decision factor for attending an event. Word of mouth is the most popular source of information among the older adult population (Tan et al., 2010; Williams & Page, 2011; Yuan et al., 2016; Gau, 2019). However, Wang, Rau, & Salvendy (2011) state that majority (89.3%) of older adults’ use the internet and almost all (87.5%) know how to send and read emails. Therefore, utilizing target online marketing strategies (e.g. email, social media ads) may be another way to communicate with the older adult population.

Marketing materials should include personal testimonials, which are an effective form of advertisement among the older adult population (William & Page, 2011). These marketing efforts should not only focus on the motivators but also address the barriers, like including a testimonial from a client who was nervous about going initially but how
their feelings changed after attending the CMP (e.g., they felt welcomed and part of a family). Additionally, strong advocacy and marketing campaigns are needed to improve the knowledge of and promote the value of the CMP as well as show how the CMP can be empowering for older adults, which all have been shown to important factors influencing program usage (Murphy et al., 2011; Tritter & McCallum, 2006).

The CMP may also benefit from exploring new menu planning options. Hoerr and others reported perceptions of the meals being unaccommodating to chronic diseases as a CMP attendance barrier (2016). The new menu plans should explore how to provide older adults with variety as this was the main preference identified in this small sample.

**Conclusion**

The CMP is noticeably valuable for current participants. The feedback obtained through these focus groups help provide a better understanding of how to further expand the CMP to meet the needs and preference of Iowans age 60 years and older. Key aspects would be creating a meal site that is easily accessible and welcoming as well as having one that empowers participants by providing more autonomy over meals and diverse education programs and activities. Collaborations and partnerships will be crucial in this process and improve the support and awareness from the community. A CMP that is more reflective of the needs and personal influences of the community-residing older adults has a higher likelihood of being more appealing and providing more effective educational programming that enables participants to thrive and age successfully.

**Key Take Aways**

- Conducting more research amongst more diverse older adult audiences to identify their CMP needs and preferences may help expand the CMP appeal to
the growing ethically and racially diverse older adult population (AoA, ACL, & HHS, 2018).

- Developing advocacy materials for the local Area Agency on Aging (AAA), healthcare services and other meal program supporters to distribute during community events (e.g. city/community council meetings, fund raising campaigns) that convey the value of the CMP may result in better funding and support.

- Strategically place marketing materials throughout the community for overall community awareness and support, particularly where older adults or their adult children frequently visit (e.g., retirement communities, churches, libraries).

- Establishing a standard name of the CMP for nationwide use may help advocacy and marketing efforts. Currently, there are many names for the CMP. The lack of a consistent name makes locating a program in different areas challenging which contributes to a lack of program awareness.

- Developing an “Ideal Meal Site Guide” may help communities choose more appealing facilities in which to host the CMP. This Guide should include key attributes desired by older adults such as whether a facility can be exclusively dedicated to older adults, it’s location in proximity to public transportation, the acoustics, availability of additional space for various programs, cooking facilities, etc.
References


Heritage Agency on Aging (2019, April 1). Narrative-Innovations in Nutrition Programs and Services.


CHAPTER 5. INCREASING CONGREGATE MEAL PROGRAM ATTENDANCE: EVALUATING THE EFFECTIVENESS OF A MEAL SITE INNOVATIONS PROJECT

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Introduction

Providing older adults with access to effective community food and nutrition programming is crucial to help them stay healthy and independent. The Congregate Meal Program (CMP) is a community-nutrition program that supports the older adult population. The CMP helps older adults eat healthier, live independently, and promotes socialization (Lloyd & Wellman, 2015; Mabli et al., 2017). This is particularly important given the growth of the older adult population. Since 2011, the baby boomers (those born between 1946 and 1964) have started to turn 65 years old making the older adult population the fastest growing age group, which is expected to double by 2060 (Administration on Aging [AoA], Administration on Community Living [ACL], & Department on Health and Human Service [HHS], 2019).

Despite the need for the CMP and its effectiveness, CMP participation is declining. Nationwide there has been an 8% decline, in Iowa a 46% decline (ACL, 2017) and Linn County, Iowa has encountered significant losses with a 74% decrease in participation from 2011 to 2017 (Heritage Area Agency on Aging, 2017). Iowa-based
needs assessment indicated this participation decline is likely due to a lack of CMP awareness, no perceived need to participate, limited transportation, and negative CMP perceptions (Hoerr et al., 2016; Schultz et al., 2020). Another factor influencing participation decline is a reduction in CMP funding that has led to the closure of meal sites, establishment of wait-lists, and decreased days meals are served (Fox-Grage, & Ujvari, 2014; Lloyd & Wellman, 2015). Moreover, there is lack of support from professionals in the health field with less than 8% of older adults being referred to the CMP from community-based organizations including where they receive health care (Mabli et al., 2017). The CMP needs increased community support and appeal among the older adult population to increase program utilization.

Utilizing the Social Marketing Theory (SMT) helps in the design of effective nutrition programs for the older adult population (Francis, Taylor, & Strickland; Francis & Taylor, 2009; Tan et al., 2010; Roy et al. 2016). A key aspect of the SMT is ensuring the target populations’ unique needs and preferences are reflected in program (Lefebvre & Rochlin, 1997; Storey, Saffitz, & Rimón, 2008). Understanding what the target audience wants and needs is completed in Step 1 of the cyclic SMT model (Lefebvre & Rochlin, 1997; Storey, Saffitz, & Rimón, 2008). Schultz and others assessed CMP participants and non-CMP participants in two urban counties in Iowa with the goal of understanding how to improve the appeal of the CMP to increase participation (2020). SMT Steps 2 through 4 utilize the information collected in SMT Step 1 to design a program reflective of these needs and preferences (Lefebvre & Rochlin, 1997; Storey, Saffitz, & Rimón, 2008). SMT Steps 5 and 6 assess the effectiveness of the program and giving feedback to continue to improve and obtain information on how to create a
program that fits the needs of the population (Lefebvre & Rochlin, 1997; Storey, Saffitz, & Rimón, 2008).

In 2019, this information was used to develop a marketing campaign and modify the Linn County CMP. This comprehensive study focused on SMT Step 5, and examined the impacts the marketing campaign and CMP modifications had on CMP awareness by local partners, program utilization by older adults and program impact on individuals (Figure 5-1).

Methods

This comprehensive impact study individually assessed program awareness and utilization, program satisfaction and evaluated the CMP as part of the Linn County
Innovation in Nutrition Program (LCINP). Therefore, each component has a detailed method section. Each study protocol was reviewed by the Iowa State University Institutional Review Board and classified as exempt. All statistical analyses were assessed using the IBM Statistical Package for the Social Sciences (SPSS), version 25.0.

**Intervention Description**

The LCINP intervention included extensive advertising techniques and the implementation of Encore Café at three Congregate Meal Program (CMP) sites. Two sites were active prior to the launch of the study while another location was established with the study. Multiple community partners were asked to serve on an advisory committee for the LCINP. This committee provided guidance in the marketing materials and CMP modifications as needed. Advertising strategies reflected those voiced by the local older adult community, which included free local print media, television and word of mouth (Schultz et al., 2020). The Encore Café also reflected desirable CMP meal characteristics identified by local older adults (Schultz et al., 2020) including daily salad bar, and quality food catered by local grocery store that gave multiple food options within the meal (see Figure 5-1). Additionally, some evidence-based programs were offered at Encore Café meal sites such as Matter of Balance, Chronic Disease Self-Management Program, and Water Aerobics for Arthritis.

**Program Awareness and Utilization Assessment**

A POST-PRE survey design was used to assess community partners’ program awareness of Heritage Area Agency on Aging (Heritage) program offerings and a database tracked the Heritage program utilization by older adults. LCINIP Advisory Committee members (n=8) completed a 19-item survey with questions regarding their occupation as well as their current (Fall 2018) and prior (Fall 2017) awareness of Area
Agency on Aging (AAA) services including the CMP. Additionally, there was a question on the likelihood of referring older adults to the CMP and how many older adults they referred to the CMP over the past year. Awareness and likelihood was rated using a five-point Likert scale (e.g., 1=“very low” and 5=“very high”), with a maximum total awareness score of 70. Heritage program participation was tracked by the Wellsky data software from 2017 (year before the study) to 2019 (year study was concluded).

For the awareness survey, descriptive statistics were used to assess sociodemographic data and total program awareness at PRE and POST. Change in total awareness was determined using paired sample t-tests. Change in awareness by program offering was analyzed via the Wilcoxon Signed Rank test. Program utilization frequencies were calculated using Wellsky; assessment of change was not possible with these data.

**Program Satisfaction**

This cross-sectional study assessed food and dining satisfaction of CMP participants at three Innovation meal sites and one Traditional meal site in Fall 2018 (PRE, n=73) and Fall 2019 (POST, n=63). Respondents completed a 14-question survey that inquired sociodemographic characteristics and CMP satisfaction. The satisfaction survey was reviewed for face validity by the research team prior to distribution. The satisfaction questions were separated into two subcategories: Food Satisfaction (e.g., food quality, meeting dietary needs, meal choice; 9 questions; 36 points) and Dining Satisfaction (e.g. welcoming ambience, friendly staff, cleanliness; 6 questions; 24 points). Respondents rated their frequency of satisfaction with various attributes using a five-point Likert scale (0 = “never,” 4 = “always”). Total satisfaction (maximum of 60 points) was calculated with the sum of the two subcategories. Total satisfaction was separated
into five categories: very satisfied (49-60 points), more than satisfied (37-48 points), satisfied (25-36 points), partly satisfied (13-24 points), and not at all satisfied (≤ 12 points). The CMP impact on respondent’s health (aka Health Impact) was also assessed in four areas including: (1) helping them eat healthier, (2) gaining nutrition and wellness knowledge, (3) helping them remain in their home, and (4) improving their health.

Respondents rated their agreement with the corresponding statements using a five-point Likert scale (1 = “strongly disagree,” 5 = “strongly agree”), with a maximum health impact score of 20 points.

Descriptive statistics were used to assess sociodemographic data, reason for attending, and total satisfaction category at PRE and POST. Between group differences were assessed using an Analysis of Covariance (ANCOVA) while controlling for covariates at PRE and POST. The surveys at PRE and POST were not pair-matched therefore within group changes over time could not be assessed. Pearson Correlation was used to examine relationships between CMP attendance, satisfaction scores (subcategories and total satisfaction) and the health impact score at POST.

**CMP Evaluation**

This quasi-experimental study examined the impact of CMP participation on nutritional risk, dietary intake, loneliness, healthy eating self-efficacy, food security, and self-reported health over six months. There were three groups: (1) Innovation, congregate meal sites taking part in the innovations intervention (n=3), (2) Traditional CMP, congregate meal site with the traditional meal service (n=1), and (3) Comparison, older adults who are not attending a CMP (n=3 senior apartments). The participants in the Innovations and Traditional groups were recruited by personal invitation of the LCINP grant team and the apartments were contacted via email.
Respondents completed a nine-page questionnaire comprised of validated tools that assessed healthy eating self-efficacy, nutritional risk, dietary intake frequencies, food security, loneliness and general sociodemographic characteristics at two time periods PRE (Month 1, early spring) and POST (Month 6, early fall). Incentives included small gifts (valued at <$5) at each data collection visit for CMP participants for the Innovations and Traditional group. The Comparison group respondents received $5 and a small gift (valued at <$5).

**Questionnaire**

The questionnaire included basic sociodemographic questions as well as questions from several validated tools. The healthy eating self-efficacy scale (goodness of fit Index: 0.98) assessed participants’ self-efficacy in overcoming various barriers to maintain healthy eating habits) (Schwarzer & Renner, 2000). This scale uses a four-point Likert scale (1 = “very uncertain,” 4 = “very certain”) to which respondents rate their likelihood of completing diet changes under five different situations; a higher total score indicates higher self-efficacy. Loneliness was measured using the six-item DeJong Gierveld Loneliness Scale (α-coefficient=0.76) (De Jong Gierveld, Van Tilburg, 2010; Penning, Liu, & Chou, 2014). The questions are divided into two subcategories: emotional loneliness and social loneliness; both subcategories are added to provide a total loneliness score (max = 6 points) (Penning, Liu, & Chou, 2014). For each question, respondents answer either “Yes”, “More or less” or “No.” A higher score indicates higher loneliness; thus a low score is desirable (Penning, Liu, & Chou, 2014). Nutritional risk and dietary intake frequencies were assessed using the validated (83% sensitivity, 75% specificity) Dietary Screening Tool (DST) (Bailey et al., 2009; Bailey et al., 2007). The DST is a 25-
question food frequency questionnaire with subcategories that reflect food groups used by the Healthy Eating Index with a higher total score reflecting a higher diet quality (Bailey et al., 2009). The total score is categorized into three nutritional risk classifications, ‘not at risk’ (>70), ‘possible risk’ (60-75), and ‘at risk’ (<60). A validated (sensitivity of 97% and specificity of 83%) two-item food security questionnaire was utilized (Hager et al., 2010).

**Data analysis**

Data analyses were only conducted for those who completed the questionnaire at both PRE and POST in the Innovations and Comparison groups. The Traditional group was excluded due to a low response rate (n=5, 25%) at POST. In addition, two respondents in the Comparison group were excluded from data analysis because they reported attending the CMP during the study. The final sample included 47 total respondents (n=26 Innovations, n=21 Comparison).

Descriptive statistics analyzed sociodemographic variables, food security, nutritional risk (DST score), loneliness, self-efficacy, and dietary intake frequencies. Baseline differences for sociodemographic variables were determined by chi-square tests. Within group changes from PRE to POST for total DST scores, dietary intake frequencies, total loneliness, social and emotional loneliness, and average healthy eating self-efficacy were assessed using paired sample t-tests. Living arrangement significantly differed between groups at PRE, therefore Analysis of Covariance (ANCOVA) was used controlling for living arrangement to determine any between group differences for the outcome variables.
Results

Awareness and Program Utilization

Respondents of the awareness survey reported working for local Area Agency on Aging (n=1), local Department of Public Health (n=2), a hospital (n=1) and other organizations (e.g. community volunteer, clinical health practice) (n=4). The average duration respondents reported being at their current position was 5 years and 4 months with a range from 5 months to 14 years and 8 months.

Total awareness scores (max=70) did not significantly differ from PRE (\(\bar{x}=28.6 \pm 8.1\)) to POST (\(\bar{x}=32.1 \pm 8.3\)). However, change in awareness from PRE to POST was noted for 6 out of the 14 AAA programs offered. This included improved awareness from PRE to POST for: adult day care/day health (PRE: \(\bar{x}=1.9 \pm 0.8\), POST: \(\bar{x}=2.4 \pm 0.9\), \(p=0.046\)), assisted transportation services (PRE: \(\bar{x}=2.0 \pm 0.9\), POST: \(\bar{x}=2.8 \pm 1.2\), \(p=0.034\)), evidence-based health program (PRE: \(\bar{x}=2.8 \pm 1.3\), POST: \(\bar{x}=4.1 \pm 0.8\), \(p=0.026\)), nutrition education services (PRE: \(\bar{x}=2.9 \pm 1.0\), POST: \(\bar{x}=3.8 \pm 0.7\), \(p=0.020\)), transportation assistance (PRE: \(\bar{x}=2.3 \pm 0.9\), POST: \(\bar{x}=3.0 \pm 1.2\), \(p=0.034\)) and the CMP (PRE: \(\bar{x}=2.0 \pm 1.3\), POST: \(\bar{x}=4.4 \pm 0.7\), \(p=0.017\)). The likelihood of the community partners referring older adults to the CMP significantly increased from PRE (\(\bar{x}=2.5 \pm 1.4\)) to POST (\(\bar{x}=4.6 \pm 0.7\), \(p=0.017\)). The majority (n=6, 75%) of respondents reported referring one to nine older adults to the CMP over the course of the study.

The participation rates and number of meals served from before the intervention (2017), during year one (2018) and year two (2019) of the grant are illustrated in Figures 5-2a and 5-2b. The number of participants increased 3,164% while the number of meals served increased 386% over the two period.
Figure 5-2a. Congregate Meal Program Participation Number by Year

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Figure 5-2b. Number of Meals Served at Congregate Meal Sites by Year

<table>
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<th>Number of Meals Served per year</th>
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</tbody>
</table>

Figure 5-2a-b. Participation Rates and Number of Meals Served at Congregate Meal Sites Involved in the Intervention.
Satisfaction

Satisfaction survey respondents’ sociodemographic characteristics at PRE and POST are shown in Table 5-1. Between group differences at PRE were age (p=.011), education (p=.037), marital status (p=.016), living situation (p=.019), weekly CMP attendance (p<.0001), and overall CMP attendance duration (p<.0001). Differences between groups at POST included education attainment (p=.05) and overall CMP attendance duration (p<.0001). The identified covariates were controlled for when analyzing outcome variables at PRE and POST respectively.

Table 5-1. Sociodemographic Characteristics of Satisfaction Survey Respondents

<table>
<thead>
<tr>
<th>CHARACTERISTICS</th>
<th>PRE (n=73)</th>
<th>TRADITIONAL (n=24)</th>
<th>INNOVATIONS (n=49)</th>
<th>POST (n=63)</th>
<th>TRADITIONAL (n=13)</th>
<th>INNOVATIONS (n=50)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>Age a</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤ 64 years</td>
<td>11</td>
<td>15.1</td>
<td>1</td>
<td>4.2</td>
<td>10</td>
<td>20.4</td>
</tr>
<tr>
<td>65 to 74 years</td>
<td>22</td>
<td>30.1</td>
<td>5</td>
<td>20.8</td>
<td>17</td>
<td>34.7</td>
</tr>
<tr>
<td>75 to 84 years</td>
<td>21</td>
<td>28.8</td>
<td>7</td>
<td>29.2</td>
<td>14</td>
<td>28.6</td>
</tr>
<tr>
<td>85 years and older</td>
<td>19</td>
<td>26.0</td>
<td>11</td>
<td>45.8</td>
<td>8</td>
<td>16.3</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>44</td>
<td>60.3</td>
<td>13</td>
<td>54.2</td>
<td>31</td>
<td>63.3</td>
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<tr>
<td>Male</td>
<td>29</td>
<td>39.7</td>
<td>11</td>
<td>45.8</td>
<td>18</td>
<td>36.7</td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>American Indian or Alaska Native</td>
<td>1</td>
<td>1.4</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>2.0</td>
</tr>
<tr>
<td>Asian</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<tr>
<td>White</td>
<td>72</td>
<td>98.6</td>
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<td>100</td>
<td>48</td>
<td>98.0</td>
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<td>-</td>
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<td>Highest level of education completed a</td>
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<td></td>
</tr>
<tr>
<td>Less than high school</td>
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<td>6.8</td>
<td>4</td>
<td>16.7</td>
<td>1</td>
<td>2.0</td>
</tr>
<tr>
<td>High school or GED</td>
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<td>32.9</td>
<td>12</td>
<td>50.0</td>
<td>12</td>
<td>24.5</td>
</tr>
<tr>
<td>Some college</td>
<td>14</td>
<td>19.2</td>
<td>2</td>
<td>8.3</td>
<td>12</td>
<td>24.5</td>
</tr>
<tr>
<td>Associate or degree technical</td>
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<td>8.2</td>
<td>-</td>
<td>-</td>
<td>6</td>
<td>12.2</td>
</tr>
<tr>
<td>Bachelor’s</td>
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<td>2</td>
<td>8.3</td>
<td>12</td>
<td>24.5</td>
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<tr>
<td>Graduate</td>
<td>10</td>
<td>13.7</td>
<td>4</td>
<td>16.7</td>
<td>6</td>
<td>12.2</td>
</tr>
<tr>
<td>Marital status</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Divorced</td>
<td>11</td>
<td>15.1</td>
<td>1</td>
<td>4.2</td>
<td>10</td>
<td>20.4</td>
</tr>
<tr>
<td>Married</td>
<td>24</td>
<td>32.9</td>
<td>3</td>
<td>12.5</td>
<td>21</td>
<td>42.9</td>
</tr>
<tr>
<td>Single, never married</td>
<td>8</td>
<td>11.0</td>
<td>4</td>
<td>16.7</td>
<td>4</td>
<td>8.2</td>
</tr>
<tr>
<td>Widowed</td>
<td>30</td>
<td>41.1</td>
<td>16</td>
<td>66.7</td>
<td>14</td>
<td>28.6</td>
</tr>
<tr>
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<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
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</tr>
<tr>
<td>Living situation</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Live alone</td>
<td>41</td>
<td>56.2</td>
<td>16</td>
<td>66.7</td>
<td>25</td>
<td>51.0</td>
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<tr>
<td>Live with spouse, significant other or friend</td>
<td>27</td>
<td>37.0</td>
<td>4</td>
<td>16.7</td>
<td>73</td>
<td>46.9</td>
</tr>
<tr>
<td>Live with adult children</td>
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<td>5.5</td>
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<td>12.5</td>
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<td>2.0</td>
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<tr>
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<td>1</td>
<td>1.4</td>
<td>1</td>
<td>4.2</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Weekly meal program attendance b</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 to 1 times weekly</td>
<td>22</td>
<td>30.1</td>
<td>1</td>
<td>4.2</td>
<td>21</td>
<td>42.9</td>
</tr>
<tr>
<td>2 to 3 times weekly</td>
<td>19</td>
<td>26.0</td>
<td>3</td>
<td>12.5</td>
<td>16</td>
<td>32.7</td>
</tr>
<tr>
<td>4 to 5 times weekly</td>
<td>30</td>
<td>41.1</td>
<td>20</td>
<td>83.3</td>
<td>10</td>
<td>20.4</td>
</tr>
<tr>
<td>Missing</td>
<td>2</td>
<td>2.7</td>
<td>-</td>
<td>-</td>
<td>2</td>
<td>4.1</td>
</tr>
<tr>
<td>Overall meal program attendance b</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than 1 year</td>
<td>37</td>
<td>50.7</td>
<td>1</td>
<td>4.2</td>
<td>36</td>
<td>73.5</td>
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<td>1 to 3 years</td>
<td>6</td>
<td>8.2</td>
<td>4</td>
<td>16.7</td>
<td>2</td>
<td>4.1</td>
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<tr>
<td>3 to 5 years</td>
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<td>12.3</td>
<td>6</td>
<td>25.0</td>
<td>3</td>
<td>6.1</td>
</tr>
<tr>
<td>More than 5 years</td>
<td>20</td>
<td>27.4</td>
<td>12</td>
<td>50.0</td>
<td>8</td>
<td>16.3</td>
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<tr>
<td>Missing</td>
<td>1</td>
<td>1.4</td>
<td>1</td>
<td>4.2</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

*a p < .05; b p < .005
Program Satisfaction

No differences for total satisfaction scores were detected between groups at PRE or POST. Both groups reported high rates of satisfaction. Total satisfaction scores (max=60 points) for the Innovations group at PRE (\(\bar{x}=58.3, 2.1\) SEM) and POST (\(\bar{x}=54.0, 1.1\) SEM) were comparable to the Traditional group (PRE: \(\bar{x}=57.4, 1.2\) SEM; POST: \(\bar{x}=55.4, 2.4\) SEM). Almost all respondents from the Innovations and the Traditional group had total satisfaction scores classified as “very satisfied” at PRE (\(n=41, 93.2\)% and \(n=19, 86.4\)% respectively) and at POST (\(n=37, 84.1\)% and \(n=12, 100.0\)% respectively). After adjusting for the covariates no differences were detected at PRE for either satisfaction subcategory. At PRE, the Innovations group had an average of 33.7 points (36 max) for food satisfaction and 23.2 points (24 max) for dining satisfaction, whereas the Traditional group had 30.0 points and 22.2 points, respectively. Food satisfaction was maintained and both groups had similar values at POST. At POST, the Innovations group had significantly higher mean dining satisfaction score (\(\bar{x}=22.7, 0.4\) SEM) compared to the Traditional group (\(\bar{x}=19.6, 1.4\) SEM) when controlling for education and CMP attendance duration (\(p=.007\)), see Figure 5-3. Moreover, overall CMP attendance duration was positively correlated with dining satisfaction (\(r=.32, p=.013\)).

Health Impact

Both groups at PRE and POST had high health impact scores. With a max score of 20 points, the Innovations group had an average of 14.7 points at PRE and 16.3 points at POST. The Traditional group had 18.3 and 16.6, respectively. Additionally, weekly CMP attendance was positively correlated with total health impact scores at POST for all respondents regardless of group (\(r=.266, p=.033\)).
Program Evaluation

Sociodemographic Characteristics

The sociodemographic characteristics of the program evaluation participants are displayed in Table 5-2. Overall, respondents for both groups were mostly white, females, who relied on Social Security for their income, had at least a high school education, and were not currently married. There was a significant difference between groups for living arrangement ($p<.0001$). Almost all (88.5%) in the Innovations group were community residing, whereas 9.5% of the Comparison group respondents were. The majority (42.3%) in the Innovations group were aged 71 to 80 years older, whereas the majority (52.4%) in the comparison group were 81 years and older.

Figure 5-3. Dining Satisfaction at POST.

Program Evaluation

Sociodemographic Characteristics

The sociodemographic characteristics of the program evaluation participants are displayed in Table 5-2. Overall, respondents for both groups were mostly white, females, who relied on Social Security for their income, had at least a high school education, and were not currently married. There was a significant difference between groups for living arrangement ($p<.0001$). Almost all (88.5%) in the Innovations group were community residing, whereas 9.5% of the Comparison group respondents were. The majority (42.3%) in the Innovations group were aged 71 to 80 years older, whereas the majority (52.4%) in the comparison group were 81 years and older.
Table 5-2. Sociodemographic Characteristics of Evaluation Study Respondents

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Innovation (n=26)</th>
<th>Comparison (n=21)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NUMBER (N)</td>
<td>PERCENT (%)</td>
</tr>
<tr>
<td><strong>Age (years)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤ 60</td>
<td>1</td>
<td>3.8</td>
</tr>
<tr>
<td>61 to 70</td>
<td>7</td>
<td>26.9</td>
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<tr>
<td>71 to 80</td>
<td>11</td>
<td>42.3</td>
</tr>
<tr>
<td>&gt; 81</td>
<td>6</td>
<td>23.1</td>
</tr>
<tr>
<td>Missing</td>
<td>1</td>
<td>3.8</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
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<td></td>
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<tr>
<td>Female</td>
<td>19</td>
<td>73.1</td>
</tr>
<tr>
<td>Male</td>
<td>7</td>
<td>26.9</td>
</tr>
<tr>
<td><strong>Race</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Asian</td>
<td>1</td>
<td>3.8</td>
</tr>
<tr>
<td>White</td>
<td>24</td>
<td>92.3</td>
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<tr>
<td>Missing</td>
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<td>3.8</td>
</tr>
<tr>
<td><strong>Education</strong></td>
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<td></td>
</tr>
<tr>
<td>High School or less</td>
<td>8</td>
<td>30.8</td>
</tr>
<tr>
<td>Some college, associates</td>
<td>13</td>
<td>50.0</td>
</tr>
<tr>
<td>degree or technical school</td>
<td>5</td>
<td>19.2</td>
</tr>
<tr>
<td>Bachelor’s degree or higher</td>
<td>5</td>
<td>19.2</td>
</tr>
<tr>
<td><strong>Marital Status</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Divorced</td>
<td>6</td>
<td>23.1</td>
</tr>
<tr>
<td>Married</td>
<td>8</td>
<td>30.8</td>
</tr>
<tr>
<td>Single</td>
<td>2</td>
<td>7.7</td>
</tr>
<tr>
<td>Widowed</td>
<td>10</td>
<td>38.5</td>
</tr>
<tr>
<td><strong>Living Arrangementa</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assisted living</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Community-residing (e.g.,</td>
<td>23</td>
<td>88.5</td>
</tr>
<tr>
<td>own home)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Senior apartment</td>
<td>1</td>
<td>3.8</td>
</tr>
<tr>
<td>Other</td>
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<td>7.7</td>
</tr>
<tr>
<td><strong>Income</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employment</td>
<td>3</td>
<td>11.5</td>
</tr>
<tr>
<td>Retirement funds</td>
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<td>42.3</td>
</tr>
<tr>
<td>Social security</td>
<td>22</td>
<td>84.6</td>
</tr>
<tr>
<td>Other (e.g. pension, spouse)</td>
<td>1</td>
<td>3.8</td>
</tr>
</tbody>
</table>

*a Between group differences were detected (p<0.0001)
**Food and Health Characteristics**

Table 5-3 depicts the food and health characteristics of the evaluation study participants. There were no baseline differences between groups. No changes from PRE to POST for food security, nutritional risk or self-reported health were detected. The majority of participants in each group was classified as “food secure” at PRE and POST. Respondents in both the Innovations and Traditional groups remained at nutritional risk from PRE (53.8%, 47.6%) to POST (53.3%, 38.1%) respectively. No one in either group rated their health as “very poor.” The majority of Innovations group respondents (30.8%) reported their health as “average” whereas 38.1% in the Comparison group reported their health as “somewhat good” for both PRE and POST.

Table 5-3. Food and Health Characteristics of Respondents for the Evaluation Survey

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Innovations (n=26)</th>
<th></th>
<th>Comparison (n=21)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PRE</td>
<td>POST</td>
<td>PRE</td>
<td>POST</td>
</tr>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td><strong>Food Security</strong></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>Secure (0 points)</td>
<td>22</td>
<td>84.6</td>
<td>18</td>
<td>85.7</td>
</tr>
<tr>
<td>Insecure (1-2 points)</td>
<td>4</td>
<td>15.4</td>
<td>3</td>
<td>14.3</td>
</tr>
<tr>
<td><strong>Nutritional Risk (DST)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>“At risk” (&lt;60 pts)</td>
<td>14</td>
<td>53.8</td>
<td>10</td>
<td>47.6</td>
</tr>
<tr>
<td>“At possible risk” (60-75pts)</td>
<td>11</td>
<td>42.3</td>
<td>6</td>
<td>28.6</td>
</tr>
<tr>
<td>“Not at risk” (&gt;75 pts)</td>
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<td>3.8</td>
<td>5</td>
<td>23.8</td>
</tr>
<tr>
<td><strong>Self-Rated Health Status</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Somewhat poor</td>
<td>5</td>
<td>19.2</td>
<td>2</td>
<td>9.5</td>
</tr>
<tr>
<td>Average</td>
<td>8</td>
<td>30.8</td>
<td>6</td>
<td>28.6</td>
</tr>
<tr>
<td>Somewhat good</td>
<td>6</td>
<td>23.1</td>
<td>8</td>
<td>38.1</td>
</tr>
<tr>
<td>Very good</td>
<td>7</td>
<td>26.9</td>
<td>5</td>
<td>23.8</td>
</tr>
</tbody>
</table>

**Impact Outcomes**

Table 5-4 denotes the loneliness and nutritional outcomes. Total and social loneliness did not change for either group from PRE to POST. Emotional loneliness improved from PRE to POST for the Innovations group (p=.017) when controlling for living arrangement; no change
was noted for the Comparison group. Healthy eating self-efficacy \((p=.042)\) dietary intake frequency was significantly higher in the Comparison group than the Innovation group at POST.

The Comparison group had a significant increase in vegetable dietary eating frequency from PRE to POST. The Innovations group consumed lower intake frequencies of processed meats compared to the Comparison group at POST \((p=.004)\).

<table>
<thead>
<tr>
<th>Table 5-4. Unadjusted Loneliness and Nutritional Outcomes of Participants ((n=47) total)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Characteristic</strong></td>
</tr>
<tr>
<td>Loneliness</td>
</tr>
<tr>
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</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Healthy Eating Self-Efficacy</td>
</tr>
<tr>
<td>Nutritional Risk Score</td>
</tr>
<tr>
<td>Dietary Intake Frequency</td>
</tr>
<tr>
<td>Whole Fruit and Juice</td>
</tr>
<tr>
<td>Total and Whole Grains</td>
</tr>
<tr>
<td>Vegetables</td>
</tr>
<tr>
<td>Lean Protein</td>
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<tr>
<td>Dairy</td>
</tr>
<tr>
<td>Processed Meat (^e)</td>
</tr>
<tr>
<td>Added Fats, Sugar, and Sweets (^e)</td>
</tr>
</tbody>
</table>

\(^a\) Lower scores indicate lower loneliness and are desirable.
\(^b\) Significant change for Innovations group from PRE to POST \((p=.017)\)
\(^c\) Significant difference between groups at POST with Comparison group scores being higher \((p=.042)\)
\(^d\) Significant change for Comparison group from PRE to POST \((p=.047)\)
\(^e\) Higher scores reflect lower intake frequencies and are desirable
\(^f\) Significant difference between groups at POST with Innovations group scores being higher \((p=.004)\)
Limitations

The generalizability of these findings is limited. First, the awareness survey was limited to a select few who were serving on the LCINP advisory committee. Serving on this committee may have motivated these professionals to promote the CMP and other AAA programs more than if they were not on the LCINP advisory committee. Additionally, although the evaluation questionnaire was comprised of were validated surveys, everything was self-reported, which may be susceptible to social desirability (Subar et al., 2015). Furthermore, our sample was not diverse and included mostly white, females that were food secure, however this is reflective of the older adult population in Iowa. Finally, convenience sampling for satisfaction and program evaluations studies may have resulted in recruiting older adults who are interested in nutrition and health.

Discussion

These results may indicate the LCINP is successful in increasing CMP awareness, utilization, and dietary intake frequencies as well as reducing emotional loneliness. This data also revealed that CMP participants are satisfied with the program regardless of being catered or the traditional meal service. Increased program awareness, high CMP participation rates and satisfaction is likely attributable to the use of the SMT.

The increase in CMP awareness and utilization suggest that the marketing campaign was successful. This success may have been in part because the marketing campaign utilized the strategies preferred by older adults. Older adults preferred print-based (e.g. newspaper, billboard, coupons) marketing (Schultz et al., 2020). Anecdotally, during the course of the study, many new CMP participants stated seeing a meal site advertisement. The substantial increase in CMP utilization as indicated by the number of meals served and participation numbers could support
the theory that better promotion of the CMP will help slow and/or reverse the current CMP participation decline. Multiple studies have also reported success using the SMT to increase awareness and participation (Black & Smith, 1994; Francis, Martin, & Taylor, 2012; Roy et al., 2016). Utilization of the target population’s feedback in program development also results in high program satisfaction (Francis & Taylor, 2009; Keane & Francis, 2018). As we reported, both groups were highly satisfied with the CMP. This high satisfaction is common for CMP (Mabli et al., 2017; Vivoda & McGuire, 2017), despite the negative stereotypes often reported in regards to the food (Hoerr et al., 2016; Vivoda & McGuire, 2017).

The higher CMP dining satisfaction ratings in the Innovations group are likely attributable to ensuring the LCINP modifications were client-centered. The Innovations sites offered a choice menu that was catered by a local grocery store chain. This is a growing trend amongst CMP meal sites with 42% of them nationwide using outside catering or contracting the meal preparation service out (Mabli et al., 2017).

In addition, the Innovations meal sites were held in appealing locations that were not only used for the CMP. For example one Innovations meal site took place at a newly developed park facility that had small art gallery, beautiful views and a garden. Conversely, the Traditional meal site was held in an older building with wood paneling walls and limited sunlight. The difference in ambience and the number of meal site participants may explain the correlation we detected between dining satisfaction (e.g., welcoming ambience, friendliness, cleanliness, meal site location, etc.) and overall CMP attendance. Liechty and others (2019) reported having a welcoming ambience, finding people to connect with and having as sense of community as factors for maintaining participation in health promotion programs.
Participants in both the Innovations and Traditional groups believed the CMP helped their health. Perceived health benefits associated with CMP participations is well documented. Two national program evaluations reported CMP participants indicating the program helping them eat healthier, feel better, and live at home (AoA, 2013; Mabli et al., 2017). Additionally, McGuire, & Vivoda, (2017) listed the impact the CMP had on participants including it was something for them to look forward to, place to know where they could get help and make new friends, as well as feel happier or more satisfied with life, learn new things, experienced positive changes in live, see friends more often, feel more engaged in community, more independent, control of life, physically active and eat healthier. These perceived CMP health benefits may be beneficial for future CMP marketing strategies because a key motivator for attending the CMP is obtaining a healthy meal and socialization (Hoerr et al., 2016; Schultz et al., 2020). In addition, highlighting the health benefits is advantageous because this older adult population is more engaged in maintaining their health than past generation (National Institute for Health, 2017).

Although an improvement in nutritional status was not detected overall or by group, it is promising that a further decline was not detected. Maintaining nutritional status in older adulthood is as important as improving it because nutritional risk increases with age (Chatindiara et al., 2018; Landi et al., 2016). In a national study, 24-hour dietary recalls revealed CMP participants have better nutritional statuses than their non-CMP participant counterparts (Mabli et al., 2017). In our sample, the majority of participants in both groups were classified as “at nutritional risk.” This is higher than the 36% of older adults who were identified as “at nutritional risk” (Lillehoj, et al., 2018). Interestingly, compared to Lillehoj and others (2018), our sample was more educated, urban and had a lower number who were widowed yet they were at higher nutritional risk. Education, rurality, and widowhood are typical risk factors for worsening
nutrition status (Boulos, Salameg, & Gateau, 2016; Chatindiara et al., 2018; Gulyas et al., 2016). Similarly, MacNab and others (2018) reported a majority of older adults participating in community-based lifestyle programs were “at potential risk” (53.7%), or “at nutritional risk” (26.4%). The rates of nutritional risk in our study were higher than that reported in Iowa. In 2016 25% of CMP participants were classified at “at risk” (Heritage Area Agency on Aging, 2019). However these rates are based on the ‘Determine Your Nutritional Health’ (NSI) checklist; which was not designed to measure nutritional risk, but rather promote awareness (Sahyoun, et al., 1997). In addition, the NSI checklist tends underreports those who are at nutritional risk (Brunt, 1999).

The dietary intake frequencies reflect less than desirable intakes for all the food categories and demonstrates the continued need for older adults to have access to the CMP. These intake frequencies are comparable to MacNab and others (2018) who reported older adults attending community-based lifestyle intervention had low to moderate intake frequencies of processed meats, lean protein, added fats, sugars and sweets, whole fruit and juice, whole grains and vegetables.

The Comparison group had a significant increase in vegetable intake frequencies from PRE to POST. This was surprising as Mabli and others (2017) reported CMP participants having higher fruit, vegetable and dairy intake compared to non-participants of similar demographics. The changes noted in the Comparison group may be attributable to the Hawthorne effect, which stimulates those being assessed to change their behavior in a desired manor (McCambridge, Witton, & Elbourne, 2014). Those in the Comparison group may have been motivated to make some behavior changes after completing the PRE questionnaire.
Promisingly, the Innovations group had lower processed meat intake frequencies than the Comparison group. This may be because, the older adults in the Innovations group were provided with hot afternoon meals thereby reducing their dependence on deli-meat sandwiches. The higher processed meat intake frequencies amongst the Comparison group may be due to them consuming deli sandwiches more often since they were not receiving a hot lunch. The lower intake frequencies of processed meats detected in the Innovations group also suggests lower sodium and saturated fats intakes for these participants. Gearan, and Niland, 2019 reported deli sandwiches (e.g., sandwiches made with processed meats) are a top source of sodium and saturated fats.

The lack of change in healthy eating self-efficacy for both groups is likely attributable to their relatively high PRE scores. The high PRE scores may not have left room for further detectable improvement. The higher self-efficacy found in the Comparison group at POST may be due to them having the perception of being able to prepare food themselves. The perceived lack of need for the CMP is a barrier to participating in the CMP (Schultz et al., 2020). Interestingly, although both groups reported high healthy eating self-efficacy the nutritional risk for both groups was high. Lillehoj and others (2018) reported healthy eating self-efficacy to be a predictor of nutritional risk status. Thus we would have expected a lower self-efficacy for our sample based on their nutritional risk scores.

The reduction in emotional loneliness detected in the Innovations group is promising. It suggests that attending the CMP helps participants to build relationships with others. This is particularly important in Iowa. Finlay and Kobayashi note that loneliness is exacerbated with poor weather (2018). Finlay and Kobayashi also reported that older adults who are white, have lower incomes and who live alone are at greater risk of experiencing loneliness (Finlay &
Kobayashi, 2018). The poor weather and at-risk sociodemographic group described by Finlay and Kobayshi (2018) reflects Iowa’s older adult population. The reduction in loneliness may also help lessen depression amongst CMP participants. Domènec-Aabella (2017) reported loneliness as a strongly correlate with depression. Moreover, senior living is often thought to help promote socialization and reduce loneliness. However, Taylor, Wang and Marrow-Howell (2018) reported high rates of loneliness among older adults in senior apartments therefore, they can still benefit from the socialization opportunities provided by the CMP.

**Conclusion**

In conclusion, the CMP is a valuable community food and nutrition program that is capable of promoting positive health outcomes. Using the SMT to guide CMP marketing and meal services resulted in a CMP marketing campaign that showed promising rates of awareness and program utilization. It also contributed towards the design and implementation of a meal program that was shown to be appealing to older adults and influenced positive outcomes.

**Take Away Points:**

- Further research is needed to see if this CMP model (e.g., strategic marketing campaign, catered choice menus, etc) is replicable in more diverse communities (e.g. rural, ethically-diverse neighborhoods, etc).
- Conducting a nationwide CMP evaluation using the same validated tools across states would provide valuable understanding of the CMP impact on nutritional risk, dietary intakes, and loneliness.
- Providing hot meals may contribute to lower intake of nutrient subgroups (e.g., sodium, saturated fat, refined grains, etc) that should be consumed in moderation and high food satisfaction.
• Extensive advertising via newspapers, television, billboards, and mailing coupons may be an effective CMP marketing strategy among the older adult population. Thus, it may be beneficial for the CMP to include a marketing allowance in their annual budget.

References


Heritage Agency on Aging (2019, April 1). Narrative-Innovations in Nutrition Programs and Services.


CHAPTER 6. GENERAL CONCLUSION

The CMP is a vital community-nutrition program that enables older adults to age successfully. Despite the benefits of the program, there has been declining participation (ACL, 2016; Heritage Area Agency on Aging, 2019). In fact, only around 5% of the population who is at greatest need (e.g., older adults with low incomes or who have difficulties with daily activities) is utilizing the CMP (Jeszeck, 2015). Applying the SMT principles (Lefebvre & Rochlin, 1997; Storey, Saffitz, & Rimón, 2008) to create needs and preference-based programming is an effective approach (Francis, Taylor, & Haldeman, 2009; Francis, MacNab, & Shelley, 2014; Roy et al., 2016). Therefore, the aim of this mixed-methods approach was to understand the needs and preferences of older adults to make the CMP more appealing and to assess the impact of an intervention that reflected those needs.

Participation is an individual and situational experience for a population (Abelson, 2001; Campbell and McLean, 2002; Cornwall, 2008; Draper & Freedman, 2010; Kenny et al., 2013; Tritter, & McCallum, 2006). Therefore, study one had a qualitative focus group (FG) design with CMP participants and non-participants. Marketing is key for increasing awareness of the CMP due to non-CMP participants not knowing about local meal sites and perceiving it as only for those in need. Marketing should highlight the main motivators voiced, which were also factors reported for aging successfully. Multiple studies have reported on the same motivators and enablers for successful aging. Additionally, marketing should reflect the routes older adults commonly hear about events in their community, which was free local print media, word of mouth and television. Furthermore, having a meal site that is accessible with various forms of transportation as well as one with a welcoming and positive ambience is crucial for the success of the CMP, which was noted in our study as well as others. This study provided insightful
information on how to create a CMP that is valued by its participants.

The *LCINP* included advertisement that reflected the preferred routes voiced in study one and the establishment of Encore Café that also reflected the desired meal preferences in study one. The comprehensive marketing campaign that was designed using older adult preferences may have contributed to the increased CMP awareness, CMP referrals, and program utilization. High CMP satisfaction was also noted at both Innovations and Traditional CMP meal sites; however, the Innovations group reported higher dining satisfaction. Participation in the Innovations CMP resulted in improved emotional loneliness and lower intake frequencies of processed meats. The higher dining satisfaction, improved loneliness and lower processed meat intake frequencies are promising results for *LCINP*.

Our findings are positive, however our small, non-diverse sample limits the generalizability. Additional research is needed to determine if this revised CMP model is replicable in more diverse communities.

In conclusion, the CMP needs to continue to investigate ways to remain relevant to the new generations of older adults in order to maintain and/or increase program participation and appeal. Since the CMP is managed by local AAA staff, these assessments need to be done locally and policies need to be in place to allow CMP delivery flexibility to help meal sites cater to the specific needs and preferences of its surrounding older adult population. Furthermore, the lack of awareness and having the belief that the CMP is for only those in need are the biggest CMP participation barriers. Continued marketing plans need to be implemented both nationally, regionally, and locally.
References


APPENDIX A. FOCUS GROUP QUESTIONNAIRE

Innovations Nutrition Program Focus Group Questionnaire

The below questions are intended to help us better understand who is attending today’s focus group session. The completion of this is voluntary. No names will be associated with these questionnaires.

1. **How old are you? _____ (years)**

2. **Are you male or female?**
   - Female
   - Male

3. **Which one or more of the following would you say is your race?**
   - American Indian or Alaska Native
   - Asian
   - Black
   - Hispanic
   - Native Hawaiian or other Pacific Islander
   - White
   - Other, please describe: __________________________

4. **What is the highest degree of school you completed?**
   - Less than High School
   - High School/GED
   - Some College
   - Associates
   - Technical School
   - Bachelor’s
   - Graduate

5. **Are you…?**
   - Single, never married
   - Married
   - Divorced
   - Widowed
   - Separated
6. **On average, how many hours do you work weekly?**
   - [ ] Retired
   - [ ] 10-20 hours weekly
   - [ ] 21-30 hours weekly
   - [ ] 31-40 hours weekly
   - [ ] >40 hours weekly
   - [ ] I do not work outside the home

7. **On average, how many hours do you volunteer weekly?**
   - [ ] None
   - [ ] <10 hours weekly
   - [ ] 10-20 hours weekly
   - [ ] > 40 hours weekly

8. **What is the primary source of your monthly income?**
   - [ ] Spouse
   - [ ] Part-time work
   - [ ] Full-time work
   - [ ] Social Security
   - [ ] Retirement Funds
   - [ ] Stock Portfolio
   - [ ] Other (e.g. Pension)

9. **What is your primary mode of transportation?**
   - [ ] Friend or Family
   - [ ] Personal Vehicle
   - [ ] Public Transportation
   - [ ] Senior Van
   - [ ] Taxi/Uber
   - [ ] I do not travel at all

10. **Which statement best describes your status for purchasing meals/grocery items?**
    - [ ] I can take care of all my meal purchasing needs independently.
    - [ ] I can shop independently for small purchases.
    - [ ] I need to be accompanied while purchasing meal items.
    - [ ] I need someone else to do all my purchasing.
11. Which statement best describes your status for preparation of meals on most days?
   ☐ I can plan, prepare, and serve nutritious meals independently.
   ☐ I can prepare adequate meals if supplied with ingredients.
   ☐ I can heat and serve my meals.
   ☐ I can plan, prepare, and serve my meals but I do not maintain a nutritious diet.
   ☐ I can plan and prepare my meals, but choose not to. I prefer to frozen meals or eating out.
   ☐ I need to have my meals planned, prepared and served.

12. In general, how would you describe your health?
   ☐ Very poor
   ☐ Somewhat poor
   ☐ Average
   ☐ Somewhat good
   ☐ Very good

13. Have you been diagnosed with any of the following? Mark all that apply.
   ☐ Cancer
   ☐ Diabetes
   ☐ Heart attack, high blood pressure, and/or high cholesterol
   ☐ Kidney Disease
   ☐ Stroke
   ☐ Other (please describe) ________________________________

14. Have you or anyone in your family (who lives with or near you) attended a congregate meal site for a meal or program within the past three months?
   ☐ No
   ☐ Yes

15. How often do you go out to eat at restaurants (including fast food restaurants)?
   ☐ ≤ 1 time/week
   ☐ 2-3 times/week
   ☐ 4-5 times/week
   ☐ > 6 times/week
16. What time of day do you most often go out to eat?
   □ Morning
   □ Afternoon (11a-2p)
   □ Late afternoon (3p-5p)
   □ Evening (6p or later)

17. Who do you eat with most often?
   □ I eat alone
   □ Spouse/Partner/Significant Other
   □ Family member (other than spouse, partner, or significant other)
   □ Friends

For the below statements, please indicate if the statement was often true, sometimes true or never true for you/your household in the last 12 months.

18. I/We worried whether my/our food would run out before I/we got money to buy more.
   □ Often true
   □ Sometimes true
   □ Never true
   □ Don't know

19. The food that I/we bought just didn’t last and I/we didn’t have money to get more.
   □ Often true
   □ Sometimes true
   □ Never true
   □ Don't know

Thank you for completing this questionnaire.
APPENDIX B. CONGREGATE MEAL PROGRAM FOCUS GROUP QUESTIONS

There is a lot of experience and wisdom around this table and I hope you’re willing to share some of it with me today. If some of the questions we ask today don’t seem to apply to you, think about a friend or family member who the question may apply to and answer from that perspective.

In the field of aging we often use the term successful aging. By definition successful aging refers to physical, mental and social well-being in older age. Take a moment to think about what successful aging means to you. Describe how aging successfully looks and feels? What do you or others who are age 60 and older need to accomplish this (e.g., community resources, support systems, financial)?

Questions intended to understand motivators for attending the congregate meal program.

You’re here today because you participate in a congregate meal program. With so many restaurant and meal options around here, what is it about the congregate meal program that keeps you coming back? (prompts: people, food, programming).

Think back to when you first started attending the meal site. What or who encouraged you to come? What were your initial feelings about the program? In what ways have your feelings changed?

Think about a friend or family member who is age 60 years or older and is not attending the congregate meal program. What would you say to them to encourage them to attend?

Questions intended to help with menu ideas

If you were given the money and the authority to create the perfect meal program for adults age 60+, what would it look like? Who would come? What events would occur? What would keep people coming back?

Food is very personal, with everyone having different preferences. It is also a cornerstone of the congregate meal program. Let’s imagine that cost was no issue and you were asked to revamp the meal program menu. Describe the foods and/or meal options that would excite you and your friends?

Questions intended to help identify environmental influences and programming preferences

Eating out for many is a part of life. Describe the factors you take into consideration when choosing a restaurant. (Prompts: food selection, choice of menu items, variety of foods offered, location, ambience)
Think about a time when you really enjoyed a meal. What about it made it so enjoyable? (Prompts: people present, type of food served, environment, location)

Every community offers different types of events. These events could be through local government agencies, Extension, churches, libraries and many others. Think about the community programs, like a class, seminar, concert, art festival, or any other program you enjoy attending. Describe how you learn about these programming opportunities. What helps you decide whether to attend?

In addition to the meal, the congregate meal program also provides an opportunity to learn. What topics are you passionate about? What types of programs/learning opportunities would you like to see offered? How would these programs look to you?

What final comments or questions do you have?
APPENDIX C.  NON-CONGREGATE MEAL PROGRAM FOCUS GROUP QUESTIONS

There is a lot of experience and wisdom around this table and I hope you’re willing to share some of it with me today. If some of the questions we ask today don’t seem to apply to you, think about a friend or family member who the question may apply to and answer from that perspective.

In the field of aging we often use the term successful aging. By definition successful aging refers to physical, mental and social well-being in older age. Take a moment to think about what successful aging means to you. Describe how aging successfully looks and feels? What do you or others who are age 60 and older need in order to accomplish this (e.g., community resources, support systems, financial)?

Questions intended to understand barriers and motivators to choosing the congregate meal program.
You’re here today because you don’t participate in a congregate meal program. The Heritage Area Agency on Aging and the Iowa Department of Aging want to better understand why. I’d like to hear more about things that get in the way or prevent you and your friends from attending the local congregate meal program?

We know there are many restaurants available to go to locally. What could we do to entice you to choose the congregate meal program over other restaurants and/or meal options?

Questions intended to help with menu ideas
If you were given the money and the authority to create the perfect meal program for adults age 60+, what would it look like? Who would come? What events would occur? What would keep people coming back?

Food is very personal, with everyone having different preferences. It is also a cornerstone of the congregate meal program. Let’s imagine that cost was no issue and you were asked to create the meal program menu. Describe the foods and/or meal options that would excite you and your friends?

Questions intended to help identify environmental influences and programming preferences
Eating out for many is a part of life. Describe the factors you take into consideration when choosing a restaurant. (Prompts: food selection, choice of menu items, variety of foods offered, location, ambience)

Think about a time when you really enjoyed a meal. What about it made it so enjoyable? (Prompts: people present, type of food served, environment, location)
Every community offers different types of events. These events could be through local government agencies, Extension, churches, libraries and many others. Think about the community programming, like a class, seminar, concert, art festival, you enjoy attending. Describe how you learn about these programming opportunities. What helps you decide whether to attend?

In addition to the meal, the congregate meal program also provides an opportunity to learn. What topics are you passionate about? What types of programs/learning opportunities would motivate you to attend a congregate meal program? How would these programs look to you?

What final comments or questions do you have?
APPENDIX D. AWARENESS QUESTIONNAIRE

Linn County: Innovations in Nutrition Program
Awareness Questionnaire

The purpose of this questionnaire is to assess your awareness of the nutrition programs and services offered by the Heritage Area Agency on Aging.

Thank you for your assistance!
Please use the following key for rating:
1. Very Low (Don’t know anything about this program or service)
2. Low (Know very little about this program or service)
3. Moderate (Aware of this program or service but there are more things to learn)
4. High (Have a good knowledge about this program or service but there are things to learn)
5. Very High (Know almost everything about this program or service)

<table>
<thead>
<tr>
<th>How do you rate your awareness about:</th>
<th>BEFORE NOVEMBER 2017</th>
<th>AFTER SEPTEMBER 2018</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Very Low</td>
<td>Low</td>
</tr>
<tr>
<td>Material aid</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Nutrition Education</td>
<td>1</td>
<td>2</td>
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<tr>
<td>Options counseling</td>
<td>1</td>
<td>2</td>
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<tr>
<td>Personal care</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Transportation</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

The following questions provide us with information about those who are completing the questionnaire.

1. Select the type of agency/organizations for whom you work. (Mark all that apply)
   - Area Agency on Aging
   - Church
   - Department of Human Services
   - Extension and Outreach
   - Home health
   - Hospital
   - Library
   - Nursing home
   - Private health care practice
   - Public health department
   - Retirement community/Senior housing
   - Volunteer agency
   - Other

2. How long have you worked for your current agency/organization?
   - Months
   - Year(s)

3. Before November 2017, how likely were you to refer adults age 60 years and older to the congregate meal program and services?
   - Very Unlikely
   - Somewhat Unlikely
   - Neutral
   - Somewhat Likely
   - Very Likely

4. After September 2018, how likely are you to refer adults age 60 years and older to the congregate meal program and services?
   - Very Unlikely
   - Somewhat Unlikely
   - Neutral
   - Somewhat Likely
   - Very Likely

5. Between November 2017 and September 2018, how many adults age 60 years and older have you referred to the congregate meal program and services?
   - None
   - 1 to 4
   - 5 to 9
   - 10 to 14
   - 15+

END OF QUESTIONNAIRE. THANK YOU.
APPENDIX E. CONGREGATE MEAL PROGRAM SATISFACTION SURVEY

Congregate Meal Site Satisfaction Survey

The below questions are intended to help us assess your satisfaction with the congregate meal program and site. Your input will help us better serve you.

1. How long have you been attending the meal program?
   Months _______ Years _______

2. On average, how many times a week do you attend the meal program?
   □ 0 to 1 times
   □ 2 to 3 times
   □ 4 to 5 times

3. What is your primary purpose for coming to the meal site?
   □ Conversations with friends and lunch
   □ A nutritious meal
   □ Programs and activities
   □ Other _______________________

4. Think about the food you receive from the meal program. Please tell us, how often are you satisfied with the...

<table>
<thead>
<tr>
<th></th>
<th>Always</th>
<th>Usually</th>
<th>Sometimes</th>
<th>Rarely</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>how well the menu options meet your</td>
<td></td>
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<tr>
<td>dietary needs and preferences.</td>
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<td>overall food quality.</td>
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<td>overall menu choices.</td>
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<td>temperature of the foods served.</td>
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<tr>
<td>variety of foods offered.</td>
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<td>way the food is cooked.</td>
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<td>way the food looks.</td>
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<td>way the food smells.</td>
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<td>way the food tastes.</td>
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</table>

5. Think about the dining experience at the meal program. Please tell us, how often are you satisfied with the...

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<th></th>
<th>Always</th>
<th>Usually</th>
<th>Sometimes</th>
<th>Rarely</th>
<th>Never</th>
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<tr>
<td>cleanliness of the facility.</td>
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<tr>
<td>friendliness of the staff.</td>
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<tr>
<td>helpfulness of the staff.</td>
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<tr>
<td>location of the facility.</td>
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<tr>
<td>overall ambience of the meal site.</td>
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<tr>
<td>overall meal site environment.</td>
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</table>

Questions continue on next page
6. Think about the programming offered through the meal program. Please tell us, how often are you satisfied with the...

<table>
<thead>
<tr>
<th>Better Choices-Better Health/Chronic Disease Self-Management</th>
<th>Always</th>
<th>Usually</th>
<th>Sometimes</th>
<th>Rarely</th>
<th>Never</th>
<th>Don’t Participate</th>
<th>Not available</th>
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<tr>
<td>Exercise programs</td>
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<td>Foot care</td>
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<tr>
<td>Fresh Conversations (nutrition education program)</td>
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<td></td>
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<tr>
<td>Guest speakers (e.g., immunizations [flu, pneumonia, shingles], diabetes, arthritis, etc.)</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Health screenings: blood pressure, blood sugar</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Matter of Balance</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nutrition Education (not Fresh Conversations)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stepping On</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tai Chi</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Water Exercise program</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

7. Please rate your level of agreement with the following statements regarding how the meal program (including the meal and programming) has helped you...

<table>
<thead>
<tr>
<th></th>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Undecided</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>eat healthier foods.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>gain nutrition and wellness knowledge</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>helped you remain in your home.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>improve your health.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

8. Do you have any recommendations to improve the meal program?
   □ No
   □ Yes, please describe:

   Questions continue on next page
The following questions help provide us with a general description of our meal program participants.

9. How old are you? ______ (years)

10. Are you female or male?  □ Female    □ Male

11. Which one or more of the following would you say is your race?
   □ American Indian or Alaska Native
   □ Asian
   □ Black
   □ Hispanic
   □ Native Hawaiian or other Pacific islander
   □ White
   □ Other, please describe

12. What is the highest degree of school you completed?
   □ Less than High School
   □ High School/GED
   □ Some College
   □ Associate or Technical School
   □ Bachelor’s
   □ Graduate

13. Are you…?
   □ Divorced
   □ Married
   □ Separated
   □ Single, never married
   □ Widowed

14. What best describes your living situation?
   □ Live alone in house, apartment or retirement community
   □ Live with spouse, significant other or friend in house, apartment or retirement community
   □ Live with adult children in house, apartment or retirement community

15. Do you follow any special dietary practices?
   □ Dairy-free
   □ Diabetes diet
   □ Gluten-free
   □ Heart healthy diet (i.e., low fat, low cholesterol, low sodium)
   □ Restrict red meat or pork
   □ Vegetarian (includes: vegan, dairy/egg only, fish only)
   □ None of the above
   □ Other
APPENDIX F. IMPACT ASSESSMENT

To be completed by ISU:Participant ID __________________________

THIS PAGE WILL BE REMOVED WHEN RETURNED TO CAMPUS AND AN ID NUMBER IS GIVEN. YOUR NAME WILL NOT APPEAR ANYWHERE ON YOUR QUESTIONNAIRE.

PLEASE PRINT YOUR ANSWER

FIRST NAME: ________________________________________

LAST NAME: _______________________________________

LOCATION OF SURVEY (Please put an 'X' by your response):

- [ ] Marion Lowe Park  [ ] Marion Library  [ ] Central City
- [ ] Senior Apartments  [ ] Jones County Senior Center
For each of the following items, mark the number that best describes your current beliefs. How certain are you that you could overcome the following barriers?

<table>
<thead>
<tr>
<th>I can manage to stick to healthful foods....</th>
<th>Very Certain</th>
<th>Rather Certain</th>
<th>Rather Uncertain</th>
<th>Very Uncertain</th>
</tr>
</thead>
<tbody>
<tr>
<td>... even if I need a long time to develop the necessary routines.</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>... even if I have to try several times until it works.</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>... even if I have to rethink my entire way of eating.</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>... even if I do not receive a great deal of support from others when making my first attempt.</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>... even if I have to make a detailed plan.</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

For each of the following items, please mark your level of agreement with the following questions.

<table>
<thead>
<tr>
<th>I experience a general sense of emptiness</th>
<th>Yes</th>
<th>More or Less</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>I miss having people around me</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I often feel rejected</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>There are plenty of people I can rely on when I have problems</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>There are many people I can trust completely</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>There are enough people I feel close to</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Please answer the following questions about your dietary intake.

1. How often do you usually eat fruit as a snack?
   - Never
   - Less than once a week
   - 1 or 2 times a week
   - 3 or more times a week

2. How often do you usually eat whole grain **breads**?
   - Never or less than once a week
   - 1 or 2 times a week
   - 3 or more times a week

3. How often do you usually eat whole grain **cereals**?
   - Never or less than once a week
   - 1 or 2 times a week
   - 3 or more times a week

4. How often do you usually eat candy or chocolate?
   - Never
   - Less than once a week
   - 1 or 2 times a week
   - 3 or more times a week

5. How often do you eat crackers, pretzels, chips, or popcorn?
   - Never
   - Less than once a week
   - 1 or 2 times a week
   - 3 or more times a week

6. How often do you eat cakes or pies?
   - Never
   - Less than once a week
   - 1 or 2 times a week
   - 3 or more times a week

7. How often do you eat cookies?
   - Never
   - Less than once a week
   - 1 or 2 times a week
   - 3 or more times a week
8. How often do you eat ice cream?
   - Never
   - Less than once a week
   - 1 or 2 times a week
   - 3 or more times a week

9. How often do you eat cold cuts, hot dogs, lunchmeats or deli meats?
   - Never or less than once a week
   - 1 or 2 times a week
   - 3 or more times a week

10. How often do you eat bacon or sausage?
    - Never or less than once a week
    - 1 or 2 times a week
    - 3 or more times a week

11. How often do you eat carrots, sweet potatoes, broccoli, or spinach?
    - Never
    - Less than once a week
    - 1 or 2 times a week
    - 3 or more times a week

12. How often do you eat fruit (not including juice)? Please include fresh, canned or frozen fruit.
    - Never or Less than once a week
    - 1 or 2 times a week
    - 3 to 5 times a week
    - Every day or almost every day

13. How often do you eat hot or cold breakfast cereal?
    - Never
    - Less than once a week
    - 1 or 2 times a week
    - 3 to 5 times a week
    - Every day or almost every day

14. How often do you drink some kind of juice at breakfast?
    - Never or Less than once a week
    - 1 or 2 times a week
    - 3 to 5 times a week
    - Every day or almost every day

15. How often do you eat chicken or turkey?
    - Never or less than once a week
    - 1 or 2 times a week
    - 3 or more times a week
16. How often do you drink a glass of milk?
   - Never or Less than once a week
   - 1 or 2 times a week
   - 3 to 5 times a week
   - Every day or almost every day
   - More than once every day

17. Do you usually add butter or margarine to foods like bread, rolls, or biscuits?
   - Yes
   - No

18. Do you usually add fat (butter, margarine or oil) to potatoes and other vegetables?
   - Yes
   - No

19. Do you use gravy (when available) at meals?
   - Yes
   - No

20. Do you usually add sugar or honey to sweeten your coffee or tea?
   - Yes
   - No

21. Do you usually drink wine, beer or other alcoholic beverages?
   - Yes
   - No

22. How often do you eat fish or seafood that IS NOT fried?
   - Never
   - Less than once a week
   - Once a week
   - More than once a week

23. How many servings of milk, cheese, or yogurt do you usually have each day?
   - None
   - One
   - Two or more

24. How many different vegetable servings do you usually have at your main meal of the day?
   - None
   - One
   - Two
   - Three or more

25. Which of the following best describes your nutritional supplement use?
   - I don't use supplements
   - I use supplements other than vitamins and mineral
   - I use a multivitamin/mineral preparation (e.g. Centrum)
The below questions are intended to help us better understand who is completing these questionnaires. The completion of this is voluntary. No names will be associated with these questionnaires.

1. **During the past 3 months, how frequently have you attended a senior meal program?** (e.g., lunch at a senior center, Encore Café)
   - [ ] I do not attend lunch at a senior center
   - [ ] I receive Meals on Wheels
   - [ ] Every day it’s offered
   - [ ] 3 or more times weekly, but not daily
   - [ ] 2 times weekly
   - [ ] 1 time weekly
   - [ ] 1 to 2 times monthly

2. **How old are you? ______ (years)**

3. **Are you male or female?**
   - [ ] Female
   - [ ] Male

4. **Which one or more of the following would you say is your race?**
   - [ ] American Indian or Alaska Native
   - [ ] Asian
   - [ ] Black
   - [ ] Hispanic
   - [ ] Native Hawaiian or other Pacific islander
   - [ ] White
   - [ ] Other, please describe:

5. **What is the highest degree of school you completed?**
   - [ ] Less than High School
   - [ ] High School/GED
   - [ ] Some College
   - [ ] Associates
   - [ ] Technical School
   - [ ] Bachelor’s
   - [ ] Graduate
6. Are you...?
   □ Divorced
   □ Married
   □ Separated
   □ Single, never married
   □ Widowed

7. What best describes your current living arrangement?
   □ Assisted Living Facility
   □ Community-residing (e.g., own home, townhome, or apartment [not specifically for older adults], living with adult child or roommate, not in retirement community, etc.)
   □ Retirement community
   □ Senior Apartment Complex
   □ Other

8. What is the primary source of your monthly income?
   □ Full-time work
   □ Part-time work
   □ Retirement Funds
   □ Social Security
   □ Spouse
   □ Stock Portfolio
   □ Other (e.g., Pension)

9. In general, how would you describe your health?
   □ Very poor
   □ Somewhat poor
   □ Average
   □ Somewhat good
   □ Very good

10. Mark all the health conditions that you have been told you have.
    □ Cardiovascular disease (e.g., heart attack, high blood pressure, high cholesterol, etc)
    □ Joint issues (e.g., knees, hips, shoulders, etc)
    □ Arthritis
    □ Back issues
    □ Diabetes
    □ Lung disease (e.g., asthma, COPD, chronic bronchitis)
    □ Cancer (including history of cancer)
To be completed by ISU:  

Participant ID ____________________________

☐ Neurological (e.g., stroke, Parkinson’s)
☐ Other ________________________________

11. Please rate your level of agreement with this statement: “I feel my city/town is older adult friendly” (e.g., offers programs for older adults, ready access to services that promote aging in place, etc).

Very Supportive  Supportive  Somewhat Supportive  Unsupportive  Very Unsupportive
☐ ☐ ☐ ☐ ☐ ☐

12. During the past 3 months, were you a patient in a hospital overnight? Overnight means that you were admitted on a different day than when you left. It does not include outpatient clinic visits or non-medical stays like staying with a family member.

☐ Yes
☐ No

13. During the past 3 months, how many different times did you stay in any hospital overnight or longer? Do not count the total number of nights, just the total number of hospital admissions for stays, which lasted 1 or more nights.

Number of times __________________________

For the below statements, please indicate if the statement was often true, sometimes true or never true for you/your household in the last 12 months.

14. I/We worried whether my/our food would run out before I/we got money to buy more.

☐ Often true
☐ Sometimes true
☐ Never true
☐ Don’t know

15. The food that I/we bought just didn’t last and I/we didn’t have money to get more.

☐ Often true
☐ Sometimes true
☐ Never true
☐ Don’t know

Thank you for completing this questionnaire.
The project referenced above has been declared exempt from the requirements of the human subject protections regulations as described in 45 CFR 46.101(b) because it meets the following federal requirements for exemption:

2. Research involving use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures, or observations of public behavior, unless (i) information obtained is recorded in such a manner that human subjects can be identified, and (ii) Any disclosure of the human subjects' responses outside the research could reasonably place the subject at risk of criminal or civil liability or be damaging to the subject's financial standing, employability, or reputation.

The determination of exemption means that:

- You do not need to submit an application for annual continuing review.
- You must carry out the research as described in the IRB application. Review by IRB staff is required prior to implementing modifications that may change the exempt status of the research. In general, review is required for any modifications to the research procedures (e.g., method of data collection, nature or scope of information to be collected, changes in confidentiality measures, etc.), modifications that result in the inclusion of participants from vulnerable populations, and/or any change that may increase the risk or discomfort to participants. The purpose of review is to determine if the project still meets the federal criteria for exemption.

In addition, changes to key personnel must receive prior approval.

Detailed information about requirements for submission of modifications can be found on our website. For modifications that require prior approval, an amendment to the most recent IRB application must be submitted in IRBManager. A determination of exemption or approval from the IRB must be granted before implementing the proposed changes.

Non-exempt research is subject to many regulatory requirements that must be addressed prior to implementation of the study. Conducting non-exempt research without IRB review and approval may constitute non-compliance with federal regulations and/or academic misconduct according to ISU policy.

IRB 03/2018
Please note that you must submit all research involving human participants for review. Only the IRB or its designees may make the determination of exemption, even if you conduct a study in the future that is exactly like this study.

Please be aware that approval from other entities may also be needed. For example, access to data from private records (e.g., student, medical, or employment records, etc.) that are protected by FERPA, HIPAA or other confidentiality policies requires permission from the holders of those records. Similarly, for research conducted in institutions other than ISU (e.g., schools, other colleges or universities, medical facilities, companies, etc.), investigators must obtain permission from the institution(s) as required by their policies. An IRB determination of exemption in no way implies or guarantees that permission from these other entities will be granted.

Please be advised that your research study may be subject to post-approval monitoring by Iowa State University’s Office for Responsible Research. In some cases, it may also be subject to formal audit or inspection by federal agencies and study sponsors.

Please don’t hesitate to contact us if you have questions or concerns at 515-294-4566 or IRB@iastate.edu.

IRB 03/2018
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2. Research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures, or observations of public behavior, unless: (i) Information obtained is recorded in such a manner that human subjects can be identified, and (ii) Any disclosure of the human subjects' responses outside the research could reasonably place the subjects at risk of criminal or civil liability or be damaging to the subjects' financial standing, employability, or reputation.

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