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**Developing a Nutrition Education Curriculum for a Diverse**

 **Population of Older Adults at Bellwether Housing**

A Capstone Report

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**Table of Contents:**

***Chapter I: Introduction*…………………………………………………………………………………………………………..4**

**Overview - Nutrition Risk Among Older Adults…………………………….…………………………….4**

***Chapter II: Project Description and Justification*……………………………………………………………………..6**

***Chapter III: About Bellwether Housing*…………………………………………………………………………………..9**

 **Background………………………………………………………………………………………………………………..9**

 **Population Served…………………………………………………………………………………………………….10**

***Chapter IV: Nutrition and Health Risks Among Older Adults*…………………………………………………12**

**Nutrition Status in Older Adulthood…………………………………………………………………………12**

**Mobility and Activities of Daily Living……………………………………………………………………….14**

**Fall Risk…………………………………………………………………………………………………………………...15**

**Chronic Disease Risk………………………………………………………………………………………………...16**

**Mental Health and Wellbeing…………………………………………………………………………………..17**

***Chapter V: Nutrition and Physical Activity Education for Older Adults - Impacts and Best Practices*……………………………………………………………………………………………………………………………...19**

 **Impacts………………………………………………………………………………………………………………..…..19**

 **Best Practices…………………………………………………………………………………………………….…….20**

***Chapter VI: Lit Review Discussion and Takeaways*…………………………………………………..…………..25**

***Chapter VII: Methodology*…………………………………………………………………………………………………...26**

**Needs Assessment……………………………………………………………………………………………………26**

**Curriculum Development………………………………………………………………………………..……….28**

***Chapter VIII: Future Steps and Recommendations* ……………………………………………………………….33**

***References*……………………………………………………………………………………………………………………….….35**

***Appendix A -* Nutrition and Activity Survey…………………………………………………………………………..41**

***Appendix B -* Quantitative Survey Results**……………………………………………………………………………….**49**

***Appendix C -* Qualitative Survey Results: Survey Summary Statements**…………………………………**59**

***Appendix D* - Curriculums Reviewed**……………………………………………………………………………………….**61**

***Appendix E –* Link to Curriculum**……………………………………………………………………………………………..**61**

**Chapter I: Introduction**

The purpose of this capstone project is to address nutrition risk concerns among older adults and emphasize the importance of encouraging health behavior changes to support quality of life. Through a partnership with Bellwether Housing, an affordable housing community serving the Pacific Northwest, this project highlights the value of nutrition and physical activity education as a way to mitigate some of the health challenges that accompany aging. The primary deliverables for this project are a set of nutrition and physical activity curricula that are culturally appropriate and tailored to the diverse, older adult resident population at Bellwether. The curricula were developed with the support of extensive background research related to nutrition risk and physical activity considerations unique to older adults, as well as information about best practices for curriculum development and facilitation. These findings will be explored more extensively in chapters IV and V.

*Overview - Nutrition Risk Among Older Adults*

The population of older adults in the United States has continued to increase over time. In 2016, there were 49.2 million adults over 65 living in the United States, representing 15.2 percent of the nation’s population.[1](https://www.zotero.org/google-docs/?PJbeFk) By 2040, the population of adults 65 and over is expected to increase to 82.3 million, making up 21.7 percent of the population.[2](https://www.zotero.org/google-docs/?TD6Bcg) Therefore, prioritizing quality of life among this group is increasingly important. Targeted public health efforts to promote the health and wellbeing of older adults are essential, especially among those in marginalized populations who face additional barriers to achieving health and wellbeing, including structural racism and other inequities.

There are many factors that contribute to nutrition status among older adults. Throughout the aging process, older adults undergo a series of both physical and psychological changes that influence health.[3](https://www.zotero.org/google-docs/?3WbqRB) Many of these risks to nutrition status can be addressed through food intake and physical activity.[4](https://www.zotero.org/google-docs/?JPkLrd) Natural changes in body composition and subsequent slowing of metabolic rate among older adults brings up the necessity of maintaining and building lean body mass through regular exercise and supportive dietary intake.[3](https://www.zotero.org/google-docs/?2eVOd3) Most older adults are also living with at least one chronic disease; some of the most common conditions include hypertension, diabetes, and arthritis, all of which can be directly impacted by lifestyle shifts.[5](https://www.zotero.org/google-docs/?7zbYWn) There are also many environmental factors to consider in weighing nutrition risk among older adults, including food security status and access to culturally appropriate foods. These topics and more will be explored in depth in chapter IV. While nutrition and physical activity are both highly important contributors to health maintenance, this report will focus more closely on the impacts of education centered around physical activity and movement to prevent and manage elements of nutrition risk.

**Chapter II: Project Description and Justification**

Nutrition and physical activity education interventions are effective methods to improve health maintenance behaviors across all age groups, including older adults. Many reputable organizations including the Academy of Nutrition and Dietetics (AND) and the American Heart Association support and prioritize nutrition education delivery for older adults. The AND specifically highlights the importance of tailored nutrition education for older adults appropriate for their respective medical conditions, cultural framework, and unique needs and preferences.[4](https://www.zotero.org/google-docs/?fUf0o5)They emphasize the importance of nutrition education for prevention and management of specific chronic conditions like diabetes, cardiovascular disease, and chronic kidney disease, as well as the use of education to promote proper caloric intake for prevention of sarcopenia and malnutrition.[4](https://www.zotero.org/google-docs/?poNtCD) Physical activity interventions have also been cited across the literature more specifically for fall prevention and chronic disease management, as well as general health promotion.[6,7](https://www.zotero.org/google-docs/?CIKWp4) Positive changes in nutrition and health habits can also help promote longevity and quality of life, two primary motivators for many older adults, all while alleviating the burden of healthcare spending associated with chronic disease management.[8](https://www.zotero.org/google-docs/?RJ2Hbj) Therefore, nutrition and physical activity education interventions present the potential for a multifaceted range of benefits among older adults and the country at large.

Health behaviors are complex. Many factors influence nutrition and physical activity habits among adults, and these layers must be considered in the development of successful curricula. Individual attributes such as personal food preferences and habits interact with an array of other layers of influence, including interpersonal relationships and environmental factors, that ultimately impact eating and activity patterns concurrently.[9](https://www.zotero.org/google-docs/?l2va1Q) Some of these factors include cultural practices and social norms, as well as the food environment and financial constraints. Many of the factors that influence health behaviors are conveyed in the Influences on Food Choice model from Contento et al[9](https://www.zotero.org/google-docs/?f5YXGG):



The support of reputable organizations and extensive literature related to the benefits of nutrition and physical activity education highlight the value of the curriculum that was developed for this capstone project. Throughout curriculum development, we incorporated best practices from the literature related to adult learning and health behavior change and considered the variety of factors that influence diet and physical activity behaviors.

A significant theme of this project was the prioritization of cultural relevance and considering community needs. Bellwether serves a diverse population of residents from many backgrounds. To carry out truly community-led work, a survey was distributed to older residents at Bellwether to gather information about the needs and desires of the target population. These results were used to inform the class topics and activities. The classes I developed focused on physical activity. Our decision to devote half of the curriculum to exercise was based on the level of interest in physical activity reflected in survey findings. Through conversations with our preceptor, Elliot Swanson (Director of Resident Services at Bellwether) we also learned about the success of previous exercise classes. To gather feedback about the classes during the development phase, pilot classes were conducted with residents and staff members at Bellwether. These are more thoroughly discussed in chapter VI. The collaborative nature of this project also contributed to the value of the final products. Efforts to review the literature, develop a survey, and create curricula were conducted in partnership with a fellow UW nutrition student, Dorothy Nguyen. All of the class sessions that we developed independently are part of the same overarching set of health and wellness curricula to be used by Bellwether.

**Chapter III: About Bellwether Housing**

*Background*

Bellwether Housing is a nonprofit, affordable housing organization in Seattle. As the largest nonprofit affordable housing provider in the Pacific Northwest, Bellwether serves over 3,500 people across the Seattle area, with plans to continue opening living spaces to support even more residents. Social justice is embedded into all of the work that Bellwether carries out, as they specifically acknowledge the role of white supremacy in the United States that has contributed to housing segregation and discrimination in Seattle.[10](https://www.zotero.org/google-docs/?6xQm5A) This attention to social justice is reflected in Bellwether’s mission, which is to “create[s] stable communities and access to opportunity through affordable housing.”[10](https://www.zotero.org/google-docs/?YgBQJC) This mission statement highlights the interplay between housing security and equity for the population at large, and as a major social determinant of health, housing and the built environment are essential contributors to health maintenance and access to resources.[11](https://www.zotero.org/google-docs/?RmffL3) Therefore, safe and affordable housing in the Seattle area is an essential need to uplift underserved communities and work towards a more equitable world.

Bellwether manages a multitude of facilities that offer a safe residence along with amenities to support day to day life. There are currently 31 buildings total, with three more set to open in 2021, and one more in 2022. Three of the existing buildings are dedicated to older adult residents 65 years and older, and most residents in these buildings are 70-80 years old. Amenities include kitchens with cooking equipment as well as televisions and community spaces, which serve as locations for classes like the ones being developed in this project.[12](https://www.zotero.org/google-docs/?sZfs8w) The buildings are also situated in locations with access to public transportation and in walkable communities. The built environment is also an important social determinant of health to consider, as research has highlighted the positive association between neighborhood walkability and overall physical activity among older adults.[13](https://www.zotero.org/google-docs/?sp4h1d) Eligibility requirements for Bellwether vary depending on the building. Maximum qualifying income amounts are based on percentages of the median income of the surrounding area; each apartment has different designated percentages of the area median income (AMI) that are allowed. This is adjusted according to the size of the family as well.[14](https://www.zotero.org/google-docs/?NibVEM)The residents served in this project specifically earn less than 30 percent of the median income.

*Population Served*

Bellwether serves a diverse population of families and single adults coming from a variety of cultural backgrounds, countries of origin, and lived experiences. The racial/ethnic breakdown of residents as of 2019/2020 is as follows:[10](https://www.zotero.org/google-docs/?0giVsk)

|  |  |  |
| --- | --- | --- |
| **Race/Ethnicity** | **Resident population (%)** | **King County population 2019 (%)** |
| Black/African American | 30 | 7 |
| Asian | 9 | 20 |
| Hispanic | 7 | 10 |
| Native American/Alaskan Native | 1 | 1 |
| Pacific Islander/Native Hawaiian | 1 | 1 |
| White | 31 | 66 |
| Multiracial | 3 | 5 |
| Other | 5 | N/A |
| Not disclosed | 14 | NA |

Many individuals at Bellwether also speak languages besides English, which was reflected in our survey data later on. Some more commonly spoken languages include Mandarin, Korean, Russian, Ukrainian, and Amharic. Structural inequities and racism create additional barriers for marginalized communities to access resources, creating immense health disparities between groups. Considering the diverse population at Bellwether, many residents may face challenges that affect health status. There are many factors that influence health, including social determinants like food access, medical care, and income level, which are all complemented by the influence of structural inequities and existing biases that conspire to affect health outcomes.[11](https://www.zotero.org/google-docs/?aKcAu1) At a population level, marginalized groups disproportionately bear the burden of chronic disease morbidity and mortality; communities of color experience higher rates of conditions including diabetes[15](https://www.zotero.org/google-docs/?9RXhLW) and hypertension[16](https://www.zotero.org/google-docs/?MOp0MV)when compared to non-Hispanic White adults, and experiences of racial discrimination have been demonstrated to positively correlate with mental distress.[17](https://www.zotero.org/google-docs/?dqXweR) Many low-income and minority urban neighborhoods are food deserts, and therefore present limited options for nutritious food and more fast foods and convenience stores.[18](https://www.zotero.org/google-docs/?cIyhQm) More specifically, studies have highlighted fewer grocery stores in Black neighborhoods compared to White neighborhoods, with further distances for impoverished Black communities when compared to impoverished White communities.[18](https://www.zotero.org/google-docs/?cK0vYY) These examples and many more illustrate the challenges that marginalized communities often face in maintaining health and wellbeing.

 Working to understand the needs of marginalized populations was a vital part of the curriculum development process. At Bellwether, language barriers present a significant challenge for many residents who are not native English speakers. This consideration was a central part of determining session design, as we considered translation needs and used simpler language and images when able in the final classes. Food accessibility is also a common challenge for many residents at Bellwether; many individuals and families acquire ingredients from food banks in the Seattle area. This was another point where attention to the needs of the community were especially important to ensure that classes were inclusive and useful for the population served. Tailoring classes to consider patterns of societal inequities and their contributions to health status and behaviors was crucial for creating an inclusive and appropriate set of curricula.

**Chapter IV: Nutrition and Health Risks Among Older Adults**

*Nutrition Status in Older Adulthood*

It is crucial for older adults to incorporate behaviors that promote physical and emotional wellbeing. Nutrition status is affected by a myriad of individual, social, economic, and environmental factors that impact behaviors. Alongside a nutritious diet, regular exercise later in life is key for healthy aging. Adults tend to become less active as they grow older, which can further heighten the risks that naturally accompany aging, including chronic disease incidence and frailty.[3](https://www.zotero.org/google-docs/?1fcxf6) Sarcopenia, or age-related muscle wasting, is characterized by a loss of muscle mass and strength, leading to alterations in body composition with a higher ratio of fat to fat-free mass.[19](https://www.zotero.org/google-docs/?ybmk5T)This can lead to muscle weakness and a compromised ability to perform everyday activities and maintain independence.[19](https://www.zotero.org/google-docs/?39juqx),[20](https://www.zotero.org/google-docs/?rJAdI2)Reductions in aerobic capacity throughout aging exacerbate these challenges.[21](https://www.zotero.org/google-docs/?WxYsTH) In the face of natural processes, it is important to prioritize wellness initiatives aimed to encourage healthy aging and quality of life.

Malnutrition is also a significant concern among older adults and can lead to various health consequences. Energy intake generally decreases with age for a variety of reasons.[3](https://www.zotero.org/google-docs/?LGNdam) Smell and taste changes, dental issues, and dry mouth can make it more difficult to eat, and delayed gastric emptying can diminish appetite.[22](https://www.zotero.org/google-docs/?InsTaH),[23](https://www.zotero.org/google-docs/?d8nJNd) Nutrient malabsorption is also more common due to changes in gastrointestinal function and prescription drug interactions.[22](https://www.zotero.org/google-docs/?D3EPrL),[23](https://www.zotero.org/google-docs/?TGwF0b) All of these conditions can lead to reduced food intake, heightened dehydration risk, and micronutrient deficiencies,[22](https://www.zotero.org/google-docs/?GK0xMR) often compounded by chronic diseases and other stressors. Undernourishment is associated with a generally heightened risk of morbidity and mortality;[22](https://www.zotero.org/google-docs/?IeOIJN) studies have found that undernourished older adults experience more falls, poor wound healing, and heightened infection risk.[22,24](https://www.zotero.org/google-docs/?qNWzbf) Improving calorie intake is especially important because much of public health nutrition messaging has focused on fat and sugar restriction for chronic disease management. These messages may negatively impact some older adults and result in the underconsumption of calories.[25](https://www.zotero.org/google-docs/?iwGjPD) On the other hand, overnutrition has been linked to conditions like hypertension, cardiovascular disease, and diabetes.[22](https://www.zotero.org/google-docs/?YlZeB2) As the proportion of older adults increases and medical advances promote longevity, chronic disease prevalence continues to rise.[3](https://www.zotero.org/google-docs/?YQlkqR) This trend is challenging to address as practitioners must prioritize chronic diseases alongside concurrent risks of sarcopenia and muscle wasting among the aging population. These points highlight the importance of taking an individualized approach to nutrition and physical activity interventions tailored to respective target communities.

Physical activity is key to promoting the health and wellbeing of seniors. Regular exercise contributes to increased muscle retention and weight maintenance, thereby encouraging independence and enhanced quality of life.[26](https://www.zotero.org/google-docs/?y9J9Mo) The Physical Activity Guidelines for Americans recommend that older adults engage in 150 minutes of moderate intensity aerobic activity (or 75 minutes vigorous aerobic activity) every week, including activities like walking, biking, water aerobics, and some household chores.[26](https://www.zotero.org/google-docs/?rDFLgi) Muscle strengthening workouts are also recommended at least twice a week for maximum benefits, and can include traditional resistance exercises or others such as carrying groceries, yoga or tai chi postures, and gardening.[26](https://www.zotero.org/google-docs/?jHz0Mb)It is important to note that some older adults may experience physical or health limitations that make it difficult to meet these goals, but any form of physical activity for any length of time can help strengthen muscles and improve endurance and balance. Additionally, physical activity can be gradually increased over time to reduce any risks of injury.[26](https://www.zotero.org/google-docs/?FufeVn)

Extensive literature on the topic of physical activity in older adulthood supports the established guidelines. In a meta-analysis, Nocon and colleagues found that regular physical activity was negatively associated with all-cause and cardiovascular-related mortality.[27](https://www.zotero.org/google-docs/?GJkVHe) Additionally, physical activity positively correlates with longevity in a dose-response manner.[28,29](https://www.zotero.org/google-docs/?se8u9Y) Physical activity is also associated with a reduced risk of a myriad of chronic diseases, including diabetes, hypertension, cardiovascular disease, certain types of cancers, and mental health challenges like anxiety and depression.[30](https://www.zotero.org/google-docs/?vZTiFJ) It is crucial to frame physical activity interventions in a way that will resonate with the priorities of older adults while also considering the underlying nutrition risks widely experienced by this population. The following subsections of this literature review intend to provide more details about some specific nutrition and health concerns to consider among older adults and how movement and a nutritious diet can help mitigate these risks.

*Mobility and Activities of Daily Living*

Many older adults experience challenges when performing activities of daily life (ADLs), and declining functional status can lead to loss of autonomy.[31](https://www.zotero.org/google-docs/?wk2fjK) ADLs include basic hygiene and toileting abilities, feeding, and dressing. Nutrition status is closely related to ADL abilities, including the capacity to prepare meals and acquire ingredients.[32](https://www.zotero.org/google-docs/?qQbfNN) As adults age, sarcopenia, or age-related muscle wasting, and frailty can affect one’s ability to perform ADLs. Frailty is defined according to the Fried Frailty Phenotype as meeting three of five criteria; unintentional weight loss, low physical activity, slow gait speed, exhaustion, and weakness.[33](https://www.zotero.org/google-docs/?RAWIm4) Compounded by other challenges including low social status, comorbidities, medication use and compromised immunity, frailty can seriously impact quality of life. Frail individuals often participate in less physical activity and social interactions when compared to peers.[34](https://www.zotero.org/google-docs/?wT2BRK) Incorporating regular physical activity has been discussed throughout the literature as a way to prolong independence by preserving ADL abilities among older adults.

The ability to access nutrient dense, culturally appropriate foods and consume them is also closely tied to functional status. Challenges related to food retrieval, preparation, and feeding can all affect intake patterns and nutrition status. In a cross-sectional study, older adults with functional impairments that interfere with ADLs experienced a higher prevalence of food insecurity compared to those without these challenges.[35](https://www.zotero.org/google-docs/?j4oYAu) Another study found that food insecure homebound older adults experienced an increased likelihood of unintended weight loss over a 6 month period and increased likelihood of ingesting fewer servings of fruits, vegetables, and milk per day compared to food secure adults.[36](https://www.zotero.org/google-docs/?ZdvUgx) While there are many other factors that increase older adults’ vulnerability to food insecurity, changes in functional capacity and mobility are important to consider for this population specifically.

Well-rounded exercise routines can support everyday activities and improve mobility. Penninx and colleagues conducted a randomized controlled trial that enrolled older adults experiencing regular pain from osteoarthritis of the knees, a condition that leads to ADL disability among many older adults.[31](https://www.zotero.org/google-docs/?l8RwLT) Participants engaged in either aerobic, resistance exercise, or control groups and were watched for incidence of ADL disability. Over the 18 month follow up period, the incidence of ADL disability during the intervention was significantly lower in both exercise groups when compared to controls. Cross-sectional data echoes these findings; among a total of 1,002 women aged 65 and up living with disabilities, those who performed more physical activity demonstrated greater strength and lower degree of disability compared to those who were inactive.[37](https://www.zotero.org/google-docs/?l6e1GF) These results highlight the importance of regular physical activity and how it affects everyday life.

*Fall Risk*

 Some of the physical changes associated with aging increase risks for bone fractures and falls. Falls are the most common cause of injuries among older adults; in 2014, BRFSS data exemplified that 28.7 percent of older adults reported a fall in the previous year.[38](https://www.zotero.org/google-docs/?encreV) Hip fractures from falls specifically pose serious risks to walking ability and overall functional performance. One study demonstrated that 27 percent of adults required a walking aid a year after hip fracture surgery,[39](https://www.zotero.org/google-docs/?d23WTe) and even with rehabilitation, it is common for those with hip fractures to never return to their previous level of functional performance.[40](https://www.zotero.org/google-docs/?9HiCzB) Fall risk can be attributable to several factors including reduced muscle strength, balance, and gait, female sex, the use of certain medications, and poor vision.[40,41](https://www.zotero.org/google-docs/?FtKBfa) Calcium and vitamin D status are also closely related to bone health, and deficiencies in these micronutrients can affect fall risk. According to 2007-2010 NHANES data, 22 percent of older adults had low levels of vitamin D.[42](https://www.zotero.org/google-docs/?OfGHC1) Adequate vitamin D and calcium intake can help prevent bone fractures and thereby decrease risk of falls among older adults.[22](https://www.zotero.org/google-docs/?UVew0e) A well-rounded approach incorporating physical activity, home precautions and attention to vitamin D and calcium intake is essential to mitigating fall risk.[43](https://www.zotero.org/google-docs/?piiO26)

Well-rounded physical activity interventions are recommended across the literature for fall prevention.[6,7](https://www.zotero.org/google-docs/?FHMuen) Exercise interventions that specifically include balance activities like Tai Chi consistently found improvements in balance, mobility, and walking speed.[44–47](https://www.zotero.org/google-docs/?VyJnxJ) In a systematic review of 40 randomized control trials, Barreto and colleagues found that participants of well-rounded exercise interventions involving aerobic, strength, and balance training for one year or longer experienced a reduced risk of falls and fractures.[48](https://www.zotero.org/google-docs/?Z7kODm) The length and intensity of exercises also makes a difference; another systematic review of 44 randomized control trials observed greater reductions in fall risk among older adults who participated in exercise for a greater length of time (>50 hours over trial period) and that included more challenging balance exercises.[49](https://www.zotero.org/google-docs/?8vuNTf) Overall, the benefits of exercise for fall prevention have been well documented across the literature.

*Chronic Disease Risk*

Older adults experience a heightened risk of chronic diseases for various reasons. Studies have generally demonstrated that body weight and fat mass increase with age. Many factors can contribute to increased fat deposition, including reduced physical activity, hormone shifts, and a general decline in metabolic rate.[50](https://www.zotero.org/google-docs/?eCOKL4) Increased fat deposition that commonly occurs throughout aging carries more concern if it is concentrated intra-abdominally or hepatically, also known as android fat deposition. Android fat is more inflammatory than fat distributed to the hips and thighs (gynoid fat), and can place individuals at increased risk for insulin resistance and diabetes, ischemic heart disease, and stroke.[50](https://www.zotero.org/google-docs/?22FyjR) Physical inactivity specifically has been highlighted in the literature as a risk factor for chronic disease development as well.[51](https://www.zotero.org/google-docs/?y0P1n8)

 Alongside optimal dietary intake, regular exercise can directly address many of these risks. Exercise increases fatty acid oxidation to help avoid adipose accumulation surrounding major organs and also positively affects blood pressure, and both are associated with lower risks of diabetes and cardiovascular disease development.[34](https://www.zotero.org/google-docs/?ZHSLNC) Other conditions like osteoporosis can be positively impacted by physical activity. Through examining NHANES data, Ricci et al found that substituting 30 minutes of sedentary time with light physical activity was demonstrated to increase bone mineral density by an average of 3 mg/cm2 and reduce the risk of osteoporosis in the spine by 12 percent in women over 50.[52](https://www.zotero.org/google-docs/?jLQSnB)Physical activity can also aid in managing chronic conditions to prioritize quality of life. For example, exercise is widely recommended for managing joint pain related to arthritis, which limits everyday activity for as many as 24 million adults living with arthritis.[53](https://www.zotero.org/google-docs/?yJvKxu) The CDC specifically recommends evidence-based physical activity interventions for pain management, including walking initiatives and well-rounded exercise programs that often prioritize community engagement and behavior change.[54](https://www.zotero.org/google-docs/?n2dWWp)

*Mental Health and Wellbeing*

Aging is accompanied by many social changes that can impact eating and exercise patterns. Older adults experience high rates of social isolation,[55](https://www.zotero.org/google-docs/?oBmFh4) and being unmarried, male, less educated, or in a lower income bracket are all associated with an increased risk of social isolation.[56](https://www.zotero.org/google-docs/?rZ5lWb) Social isolation can negatively impact health behaviors. According to a longitudinal cohort study by Kobayashi and Steptoe, social isolation was correlated with decreased physical activity, and a lower likelihood of eating five servings of fruits or vegetables per day.[57](https://www.zotero.org/google-docs/?F8FfYg) Whitelock and Ensaff further explored these themes through conducting focus groups with older adults to explore the psychological impacts of isolation and effects on health behaviors.[58](https://www.zotero.org/google-docs/?qKgTeS) Multiple participants reported that a lack of support, including a lack of social settings to share the eating experience with, often led them to consume less.[58](https://www.zotero.org/google-docs/?L7Fy7X)

Cognitive abilities and mental health are significant contributors to quality of life for older adults. Studies have demonstrated that reported health-related quality of life is positively associated with degree of physical activity.[59](https://www.zotero.org/google-docs/?B2nXUy) More specifically, mind-body exercises like yoga and tai chi/qigong have the potential to impact quality of life; the results of one meta-analysis suggested that yoga was actually more effective in improving self-reported physical and mental health status, flexibility, and aerobic fitness when compared to more traditional aerobic exercise routines.[60](https://www.zotero.org/google-docs/?L3T47T) The effects of mind-body exercises like yoga, tai chi, mindful dance, and pilates have also been cited for their proposed positive effects on global cognition among older adults. In a meta-analysis, Wu and colleagues investigated a variety of studies concerning mind-body exercises, finding that participation was associated with greater improvements in global cognition compared to controls, with specific relationships between mind-body exercises and working memory, verbal fluency, and learning in adults both cognitively intact and impaired.[61](https://www.zotero.org/google-docs/?91Hl5f)

Mood and mental wellbeing are also pivotal to quality of life for older adults. Depression later in life can often go undiagnosed,[62](https://www.zotero.org/google-docs/?qvvMlO) and loneliness and social isolation are significant risk factors for suicide amongst older adults.[63](https://www.zotero.org/google-docs/?fQ2HhZ) Research has investigated the potential role of mindfulness practices in mitigating these challenges. In a systematic review and meta-analysis, Weber and colleagues found significant (yet small effect size) improvements in depressive symptoms among older adults participating in yoga and tai chi interventions,[64](https://www.zotero.org/google-docs/?TlHLnM) while similarly, Laird and colleagues observed the benefits of tai chi on relief of depressive symptoms among older adults, including one study that specifically included older adults with chronic illness and depression.[65](https://www.zotero.org/google-docs/?M3tRRv) These findings highlight the importance of incorporating a more holistic approach to exercise when working with older adults to enhance quality of life and emotional state in addition to physical wellbeing.

**Chapter V: Health and Wellness Education for Older Adults - Impacts and Best Practices**

*Impacts*

Curriculum design determines the success of a nutrition or physical activity intervention, and there are many points to consider throughout the development process. The numerous factors that affect individual food choices and exercise patterns must be considered during curriculum planning to address how these may influence targeted health behaviors. In addition to considering relevant challenges like chronic disease management and heightened risks of malnutrition and sarcopenia, older adults have accumulated an array of lived experiences that influence choices.[66](https://www.zotero.org/google-docs/?w1nvay) Familiar foods carry emotional and cultural significance, especially when patterns have been repeatedly established over long periods of time.[67](https://www.zotero.org/google-docs/?51efYS) By acknowledging and celebrating these differences often rooted in cultural traditions, nutrition interventions can begin to be more effective in instilling behavior change among older adults.

A lack of knowledge about optimal nutrition habits can further impact health status, especially in the face of chronic diseases. The importance of appropriate nutrition education is exemplified in the literature related to diabetes management, a condition faced by approximately 26.8 percent of adults aged 65 and older in the U.S.[15](https://www.zotero.org/google-docs/?XKtndF) The literature surrounding education for diabetes management has demonstrated how nutrition and physical activity can contribute to improvements in dietary intake, knowledge acquisition, self-efficacy, and various clinical markers. In one intervention, education regarding hemoglobin A1C and self-management strategies like regular physical activity, a defined dietary regimen, and spacing out carbohydrate consumption were associated with a decrease in hemoglobin A1C levels by as much as 1.46 percent over a three to five month period.[68](https://www.zotero.org/google-docs/?XPc4LS) Redmond et al observed an increased frequency of diabetes self-management activities upon participation in a nutrition education program, specifically including actions to follow an optimal dietary plan.[68](https://www.zotero.org/google-docs/?EbgaNI) In another diabetes intervention, Miller et al observed improvements in decision-making skills and self-efficacy to make optimal food choices after an intervention focused on label reading and other practical strategies.[69](https://www.zotero.org/google-docs/?tTa3hb) Improvements in target health behaviors can positively influence quality of life and longevity, pinpointing the legitimacy and need for well-developed nutrition education curriculums for older adults.

Nutrition education can positively impact health behaviors across various populations. Kim et al found significant results related to dietary intake in their study focused on adults in an institutional setting. After education sessions with a dietitian, there were decreases in nutritional risk indicators and increased consumption of all macronutrients and many essential micronutrients observed.[70](https://www.zotero.org/google-docs/?WaFYtg) Dietary intake habits also improved in a study by Babatunde et al focused on calcium intake and osteoporosis knowledge, where researchers observed increased calcium intake and related knowledge, and self-efficacy accompanying this behavior.[71](https://www.zotero.org/google-docs/?ZfmA6M) Increased knowledge scores were also observed in a dementia prevention intervention conducted by Wallace et al, who noticed a total knowledge increase of 43 percent that was maintained after 3 months post-intervention.[72](https://www.zotero.org/google-docs/?PZUY6T) Additionally, Mitchell et al saw significant results for increased supplement use after an nutrition intervention related to the benefits of certain supplements and drug-nutrient interactions (among other topics), despite small effect sizes.[73](https://www.zotero.org/google-docs/?lN7662) These examples highlight the impacts that nutrition education can have on dietary behaviors and knowledge acquisition.

*Best Practices*

The existing literature surrounding the efficacy of nutrition and physical activity education highlights the value of these interventions for health. Murimi and colleagues conducted a systematic review that summarized key characteristics among nutrition interventions that met established objectives. These included longer interventions (>5 months), fewer and more focused objectives (<3 objectives), and using learning theories appropriately. In this particular review, 61 percent of the studies that were theory-based met established objectives.[74](https://www.zotero.org/google-docs/?pLQ48u) Extensive planning based on the target audience appears to also be key, with learning objectives specifically tailored to the behaviors facilitators are hoping to target.[75](https://www.zotero.org/google-docs/?qOVJGu) Strategies to instill behavior change include having more hands-on activities to promote social interaction and active participation, such as discussions or goal-setting.[9](https://www.zotero.org/google-docs/?PHMHXj) Efforts to streamline messaging to one or two key concepts per session, space out sessions over a period of time to solidify learning, and create an engaging environment were demonstrated to promote success across studies,[67,69,71](https://www.zotero.org/google-docs/?bVyvUP) echoing findings from Murimi et al.[74](https://www.zotero.org/google-docs/?b6mJs8) For example, some of the key strengths reported by Babatunde et al in an osteoporosis prevention program included their multi-session model (6 week period) and small class sizes that allowed for active engagement.[71](https://www.zotero.org/google-docs/?wfJHS5) Supplemental resources like handouts were distributed at the end of each session, and hands-on activities encouraged material acquisition.[71](https://www.zotero.org/google-docs/?5LVYjE) Feedback from participants at rural congregate meal sites in another study confirmed the necessity of active learning strategies; many of the participants were unsatisfied with the use of a take-home booklet to receive nutrition information, which was the primary method of education in this intervention. Incorporating lessons throughout mealtime to encourage discussion and active participation was a suggestion that may have helped make the material more interesting to participants, echoing that importance of a behavior focus in planning out curriculum.[67](https://www.zotero.org/google-docs/?kXUH6Y)

Multicomponent interventions have also shown promise throughout the physical activity education literature, particularly in interventions aimed to reduce fall risk. Combining different types of exercises, including balance and strength training exercises, have been effective in helping to reduce falls.[36](https://www.zotero.org/google-docs/?DD2WRI),[49](https://www.zotero.org/google-docs/?UoYp4j),[77](https://www.zotero.org/google-docs/?NhwDNv),[55](https://www.zotero.org/google-docs/?547qwW),[47](https://www.zotero.org/google-docs/?PqnCFt) Additionally, more intensive exercise programs with challenging balance exercises and more time spent exercising saw greater associations with fall reduction.[49,78](https://www.zotero.org/google-docs/?63SqIM) The results of these studies highlights the usefulness of well-rounded exercise interventions for the wellbeing of older adults. The following subsections contain more specific details about best practices gathered from the literature that were ultimately used to influence the curriculum developed for Bellwether for this project.

Community-Based Interventions

The importance of social interactions and community building was evidenced in several observed studies. Nutrition education sessions can provide an opportunity to gather and converse with others about learning experiences.[72,79](https://www.zotero.org/google-docs/?8nkP6s) In a dementia prevention program, Wallace et al heard from focus groups that independence was a crucial motivator for older adults to focus on health maintenance, as they hoped to avoid placing responsibility on their loved ones to take care of them. They also reported their enjoyment of the social opportunities that the nutrition classes presented.[72](https://www.zotero.org/google-docs/?Chf6TN) In another study, Klinedinst and colleagues were able to observe the strengths of creating a space for socialization about cardiovascular disease education. Participants connected over a meal during these sessions, which opened up discussions about cooking techniques and other personal anecdotes, and qualitative surveys confirmed that the participants enjoyed engaging in these sessions.[79](https://www.zotero.org/google-docs/?7sZPZq) Community-based interventions offer this benefit of more interaction and a relaxed atmosphere. Similarly, community exercise interventions show promise. Carlucci et al illustrated this in a study of a “joyful movement” program aimed to prevent falls in older adults. The community-based nature and emphasis on fun and positivity were pivotal to the success of the classes, as there were significant increases in confidence to avoid falls, and better functional reach and modified falls efficacy scale scores.[44](https://www.zotero.org/google-docs/?z88Q4l)A combination of group exercise sessions with related home practices have also been highlighted as a model for successful physical activity interventions. In a systematic review and meta-analysis by Teng et al, combining group and self-directed exercises demonstrated success in meeting study objectives related to functional performance, such as gait or balance ability.[80](https://www.zotero.org/google-docs/?ETt7Pw) Overall, opportunities for social interaction and group engagement in interventions address many elements of nutrition risk concurrently.

Theory-Based Interventions

To specifically target behavior changes, successful interventions across the literature largely utilized behavior theories to inform curriculum development. Interventions based in behavior change theory are often more successful than interventions where theory is used loosely or not at all.[81](https://www.zotero.org/google-docs/?aVCnOk) It is important to note that integrating more behavior change constructs within an intervention does not necessarily equate to greater degree of meeting desired outcomes;[80](https://www.zotero.org/google-docs/?JTa2Gk) Murimi and colleagues highlight the distinct differences between using learning theory thoroughly in the design of an intervention compared to just briefly in the methodology, as more thorough integration correlated to success in meeting study objectives.[74](https://www.zotero.org/google-docs/?geWcW7) Considering the population and what drives behavior change can help determine which theory should be used to guide the planning process for an intervention. In designing curriculum that is appropriate for older adults, it is necessary to consider how adults learn. The idea of “andragogy,” or adult learning theory (ALT), was developed by Malcolm Knowles, and this theoretical model highlights key areas to consider for the learning process among older adults. These include a consideration and respect for adult learners’ past experiences and needs, self-directed learning, introducing only a limited number of concepts at a time, and fostering a safe, welcoming learning environment.[82](https://www.zotero.org/google-docs/?rp628e)

In educational settings for older adults, the Social Cognitive Theory and the Transtheoretical Model (TTM) have been commonly used. The social cognitive theory (SCT), developed by Albert Bandura, describes that interactions between an individual’s personal attributes and environment ultimately impact behaviors.[83](https://www.zotero.org/google-docs/?PpihRl) SCT emphasizes the power of learning through observations, with specific constructs like self-efficacy (confidence in one’s own ability to adopt a behavior), observational learning, and reinforcement.[83](https://www.zotero.org/google-docs/?7sGo8l) The TTM, also known as the Stages of Change Model, is also widely used throughout the literature. The TTM describes several stages that adults move through in the acquisition of new behaviors. These stages include precontemplation, contemplation, preparation, action, and maintenance. The stage that a participant is present in can widely influence their reception of educational materials, so it is important to gage this throughout the planning process.[83](https://www.zotero.org/google-docs/?MCnfEU) The use of behavior change theories in nutrition education interventions across the literature highlights the strengths of considering human behaviors in curriculum development for this capstone project to positively influence learning outcomes for Bellwether residents.

The success of existing theory-based educational programming exemplifies the many benefits of considering behavioral theories to plan nutrition education curriculums. One example is the Expanded Food and Nutrition Education Program’s (EFNEP) Eating Smart ● Being Active curriculum, which aimed to provide nutrition knowledge and facilitate behavior changes related to cooking and shopping for food in low-income families. The curriculum is composed of 8 lessons that draw upon tenets of SCT and ALT. The curriculum has been validated in multiple studies, and the curriculum adheres to the core tenets of SCT. According to a pre- and post- evaluation of the Eating Smart ● Being Active program in Iowa, participants demonstrated improvements in dietary intake after being in the program; these included specific increases in the number of servings of protein, dairy, vegetables, bread, and fruit. The validation of the Eating Smart ● Being Active curriculum in relation to SCT and ALT demonstrates the strength of this program and its potential in educating adults and bringing about behavior changes.[81](https://www.zotero.org/google-docs/?hKlJox)

Cultural Relevance and Tailoring

Cultural relevance is also vital to consider in nutrition education interventions. Considering cultural beliefs and lived experiences of participants can make the material more relevant and accessible, leading participants to take more out of the experience.[8](https://www.zotero.org/google-docs/?7Ck2lL) Involving participants in discussions about health and wellness creates a richer educational experience. In a nutrition intervention related to cardiovascular disease risk, researchers mindfully included culturally sensitive ways to flavor food to participants following a low sodium diet, which ultimately prompted a discussion among subjects about creating delicious, flavorful dishes with spices and varying cooking techniques.[79](https://www.zotero.org/google-docs/?zMhb9s) By providing an inclusive environment, more diverse members of the community were able to contribute recipes and ideas for flavoring foods that stray from adding excess salt and fat. This sharing of knowledge and social connection highlights the importance of considering cultural relevance and the benefits of giving space for subjects to share their own unique knowledge and skills. This opportunity for discussion also echoes the importance of including active learning activities to enforce behavior changes. Considering both the nutritional status of a target population as well as their specific interests in the realm of food and nutrition helps to make the material more applicable to older adult audiences, and this is best achieved through learning about the audience as much as possible prior to the intervention.[75](https://www.zotero.org/google-docs/?jFeHJA) For older adults, common motivators behind health maintenance behaviors include chronic disease prevention, longevity, and independence.[72](https://www.zotero.org/google-docs/?YAyd6m) Taking cultural relevance and priorities into account will likely promote knowledge acquisition and behavior changes among participants, as the material will be more relevant to participants.

**Chapter VI: Lit Review Discussion and Takeaways**

The results of the literature review outlined in chapters IV and V heavily influenced the curriculum developed for Bellwether. Because my curriculum focused on exercise and physical activity, literature findings related to the benefits of movement were prioritized for the classes I developed. All of the classes I created emphasized the benefits of physical activity that can directly improve quality of life, including everyday mobility and ADLs, chronic disease management, and improvements in mood and emotional wellbeing. In fact, the extensive literature related to mind-body movements inspired an entire class focused on balance and muscle strength activities to improve quality of life and mitigate fall risk. Additionally, I strove to incorporate multicomponent exercises across all three exercise classes to expose participants to a variety of movements. Multicomponent exercises were highlighted across the literature to improve mobility and mitigate fall risk. I also hoped that exposure to a variety of exercises could help participants discover which ones brought them joy, and therefore, which might be best to incorporate into daily life.

Best practices cited throughout the literature, especially cultural relevance and the importance of tailoring materials, were constantly revisited throughout the curriculum development process. The literature review adopted a more population-based approach to creating curricula and the social determinants that affect diverse, older adult communities. Yet, in the more specific environment of Bellwether, it was crucial to balance individualized needs as well. Materials were designed specifically for the population at Bellwether, with attention to the incorporation of images, activities, and ideas that were culturally relevant and inclusive of people of many backgrounds, mobility levels, and interests. Much of the information used to tailor the curriculum was based on results from a nutrition and physical activity survey that was conducted to continue to further tailor materials to the target audience. This is discussed in the next chapter. The community setting at Bellwether also provides an ideal space to deliver programming that allows residents to engage in discussions and learn from one another, which was highlighted in the literature review as a way to uplift the voices of individuals and the knowledge they bring to health discussions.

**Chapter VII: Methodology**

*Needs Assessment*

Survey Development

A primary focus throughout this capstone project was to remain attuned to the needs of the target population. We decided to conduct a survey to obtain a more thorough understanding of areas of interest and unique needs among residents to tailor our classes appropriately. The survey was sent to older residents across four different buildings managed by Bellwether. There were several steps that led to eventual dissemination. First, existing literature surrounding surveys and examples of food and nutrition-related surveys were reviewed to inform the design.[84–88](https://www.zotero.org/google-docs/?LyN9XM) Next, a survey was drafted according to findings. Survey questions were grouped into categories based on the overarching topic area, including whole fruit, vegetables, whole grains, proteins, fats, water, physical activity, and food access/preparation. There were multiple question designs used in the survey as well, including multiple choice, select any/all that apply, and open write-in answers. See appendix A for the complete survey. To learn more about the unique needs of residents, careful attention was taken to understand residents’ access to food and resources to make the curriculum approachable and inclusive. This informed class content by ensuring that, for example, considerations were made as many residents acquire food from the food bank. Several drafts were reviewed with Michelle Averill, a key advisor in this project, and Elliot Swanson, who provided feedback to help finalize the survey.

Survey Distribution

Survey distribution required several steps. Many of the residents at Bellwether are not native English speakers, therefore Bellwether utilized internal translation services to translate the surveys into several different languages, including Russian, Korean, and Chinese. Surveys were printed and delivered to resident rooms to be filled out individually. Participants were incentivized to participate by being entered into a gift card raffle. Once the surveys were completed, paper copies were returned to us. We scanned the surveys and entered all data into a Google form. Translation services were necessary again as many write-in answers were written in other languages. Funds from the UW Nutritional Sciences Program were utilized to pay for translation services at this stage.

Survey Analysis

There were a total of 115 respondents to this survey. Physical activity data were prioritized for the purposes of my project specifically, while Dorothy Nguyen focused more closely on food and nutrition findings. See appendix B for complete survey results from all sections. Write-in answers were not formally coded, but all write-in responses were reviewed in depth and summarized. To analyze write-in survey results, Dorothy and I independently drafted statements to describe overarching patterns for each write-in question. Then, we came together to compare ideas and draft finalized summary statements that represented both of our impressions from the data. Survey results summaries for each section of the survey can be found in appendix C.

We decided to include physical activity as a curriculum focus area after conducting the survey, as there was a demonstrated interest in exercise among residents and staff. This was clarified after the survey was distributed, so there were only three questions that directly addressed physical activity. In response to “how often do you do exercises to increase muscle strength and endurance, such as lifting weights or push-ups, etc?” out of 100 respondents, 45% reported exercising 0-2 times per week, 23% reported 3-4 times per week, 5% reported 5-6 times per week, and 25% reported exercising daily. Question two asked “are you interested in learning more about exercises that improve muscle strength and endurance?” Out of 103 responses, 61.1% reported yes, 21.4% said no, and 17.5% said maybe. There was also space for a write-in answer as part of this question, which asked “if you said yes to the previous question, what exercises interest you?” This question received a vast array of responses (n=50), including specific interests in age-appropriate exercises, walking, tai chi and other mindful movement exercises, swimming, and muscle strengthening, among others. For question three, “have you ever participated in any other activities such as yoga, meditation, tai chi, stretching, etc?” out of 97 responses 55% said yes and 45% said no. There was also an option for writing in as part of this question, “if you answered yes to the previous question, which activity or activities?” Answers (n=47) here also ranged immensely between participants, including pilates, yoga, stretching, meditation, and tai chi, among many others. Notably, many participants mentioned the need for exercises that were appropriate for aging adults, which was intertwined into all class sessions with options for modifications depending on level of mobility and comfort.

Overall, the results of the survey across both the food/nutrition and physical activity sections highlighted interest in a variety of topics. In the physical activity section specifically, the majority of participants (81%) responded either “yes” or “maybe” that they were interested in learning more about physical activity, illustrating the relevance of this topic for curriculum development. The variety of write-in answers shared by residents also provided concrete ideas for exercises that were considered in the curriculum development process to align interests with the class content. Primary strengths of this survey included attention to specific needs and cultural relevance throughout question development, as well as the consideration of evidence-based surveys and literature findings. Additionally, feedback with key informants Elliot Swanson and Michelle Averill positively influenced the final product.

*Curriculum Development*

Topic Identification

After survey responses were analyzed, overarching topic areas were considered based on these results. It appeared that an overarching set of curricula related to physical activity and another related to food and nutrition would be beneficial for this project, as interest spanned across both of these topics. We then discussed specific class topics that would fit under these overarching themes according to survey results and feedback from Elliot Swanson, who pinpointed specific areas of interest based on anecdotal points, such as a need to address falls as this is a concern among residents. A plan evolved to create curricula that would “talk” to each other, integrating ideas and design themes to unify the two curricula and create an overarching set of health and wellness sessions for use by Bellwether.

Curriculum Development

After choosing topics, the curriculum development process began. The curricula were grounded in extensive evidence gathered from the literature review (see chapters IV, V) about elements of nutrition risk in older adulthood as well as best practices for nutrition education delivery. The development process began with filling out a lesson plan template, containing behavioral goals of the session, what theoretical model(s) were used to design the session, as well as specific details of the activities to take place in class. The three physical activity classes were primarily grounded in adult learning theory (ALT) and social cognitive theory (SCT). The primary model utilized to design the curricula was the USDA’s Eat Smart, Live Strong[89](https://www.zotero.org/google-docs/?qxGDdD) curricula, which presented a useful example of how to design a facilitator guide to be informative yet digestible for facilitators.

Pilot Class

 To continue incorporating the voice of the community, the first classes for both the physical activity and nutrition curricula were piloted with a small group of residents and staff members virtually. The first physical activity class, “Let’s Get Active,” was piloted on March 5, 2021. To advertise for the class, a flyer displaying the day, time, and Zoom link to the class were shared with building coordinators to forward to residents. Participants were also given printed handouts to accompany their experience in the class. Three residents were in attendance at the pilot, as well as three staff members and Dorothy Nguyen. At the start of the session, residents were advised to take note of elements of the class they enjoyed and did not enjoy, and to prepare to share their thoughts at the end of the session. The pilot of “Let’s Get Active” gleaned ample feedback that directed the finalized version of the curriculum. Feedback included overarching enjoyment of the class activities, and participants noted that no part of the class that was unenjoyable to them besides a late start time. Several participants shared their appreciation of the inclusive exercise practices for people of differing levels of mobility, and also provided suggestions for how some of the activities could be designed to be even more inclusive that were incorporated into the final classes. A key theme of the pilot session feedback was also the value of the community-driven activities. Participants expressed that being able to exercise and see others moving along with them was fun and engaging, especially in the environment of the pandemic, and that the discussions in the class were insightful and useful for participants.

Curriculum Finalization

Dorothy and I finalized the curriculum in tandem. After we both constructed our three individual classes, we met several times to ensure that the classes worked together and were cohesive. We focused on having similar facilitator guides and instructions, as well as subject matter and content that flowed nicely from class to class. There are three physical activity classes that I created as well as three food and nutrition classes that alternate in succession; the first class is focused on physical activity, whereas the next one on food, and so on. The classes were designed to build upon each other and acknowledge the lessons of the previous course. The three physical activity classes that I created are listed below in bolded text, with titles and short descriptions of each. Dorothy’s food and nutrition classes are also included in italicized text in order to provide a more complete picture of the finalized curriculum. Class overviews are also included below to provide an idea of what will be covered in each session.

Curriculum Outline:

**CLASS 1: Let’s Get Active! (Sarah)**

**Learning Objectives:**

* **Understand the benefits of being physically active in older adulthood**
* **Identify the 2 main types of exercise (cardio and muscle strength)**
* **Articulate *at least 1* solution for the challenges of physical activity with peers**

**Class Outline:**

* **Engage in a warm-up exercise activity and quick icebreaker**
* **Learn more about the benefits of physical activity**
* **Review the 2 main types of physical activity (cardio and muscle strength)**
* **Problem solve with peers about challenges they face in being physically active**

*CLASS 2: Balanced Eating Patterns (Dorothy)*

*Learning Objectives:*

* *Describe at least one reason why they should consume a balanced diet.*
* *Identify components of MyPlate*
* *Prepare a balanced meal or snack*

*Class Outline:*

* *Begin the class with a warmup stretch and icebreaker.*
* *Review MyPlate and the benefits of eating a balanced diet.*
* *Discuss nutrients that are important in supporting health.*
* *Participate in a cooking demonstration*

**CLASS 3: Fueling For Fitness (Sarah)**

**Learning Objectives:**

* **Describe the role of different macronutrients in promoting an active lifestyle**
* **Discuss ways to stay hydrated to promote health and safety**
* **Prepare a snack that will support energy levels and muscle recovery**

**Class Outline:**

* **Engage in a warm-up exercise activity and quick icebreaker**
* **Review food groups from the last session and some specific foods that can be eaten before and after workouts**
* **Learn about the importance of staying hydrated**
* **Engage in a post-workout snack prep demonstration**

*CLASS 4: Reading Food Labels and Budgeting (Dorothy)*

*Learning Objectives:*

* *Describe different parts of a food label*
* *Describe how to grocery shop on a budget or with other limitations*

*Class Outline:*

* *Begin the class with a warmup stretch and icebreaker.*
* *Review the different parts of a food label.*
* *Discuss tips for food shopping and creating balanced meals on a budget or with other limitations.*
* *Participate in a cooking demonstration*

**CLASS 5: It’s All About Balance! (Sarah)**

**Learning Objectives:**

* **Describe the benefits of mindful movement activities like yoga or tai chi**
* **Understand how balance and muscle strength activities can help prevent falls**
* **Practice exercises that will improve balance abilities and muscle strength**

**Class Outline:**

* **Engage in a mindful warm-up exercise activity and quick icebreaker**
* **Learn more about mindful movement and the benefits of mindful movement practices**
* **Talk about falls and how to reduce risk of falling with exercise and other tips**
* **Engage in a balancing exercise activity**
* **Participate in a culminating body scan activity and quick discussion**

*CLASS 6: Planning and Storing Meals for One (Dorothy)*

*Learning Objectives:*

* *Prepare a meal for one person.*
* *Plan meals for the week.*
* *Describe different ways to store foods.*

*Class Outline:*

* *Begin the class with a warm up stretch and icebreaker.*
* *Learn how to prepare a meal for one person.*
* *Practice planning meals for the week.*
* *Discuss ways to store food for longer*

The entire curriculum, including complete facilitator guides, class handouts, and other materials, can all be found through the link in appendix E.

**Chapter VIII: Future Steps and Recommendations**

There is ample opportunity to continue evolving this set of curricula and leverage it to jumpstart future health promotion efforts among older residents at Bellwether. The survey results illustrated an abundance of interest in topics that were not necessarily addressed in the limited set of classes developed for this project. These included an interest in recipes from a variety of cultures, and specifically how to incorporate imported fruits and vegetables used in tropical and Asian cuisines, as well as more about plant proteins. Dorothy tried to include an array of multicultural foods and recipes in her classes, and this could be further expanded in future sessions. In terms of exercise, there was a demonstrated interest in a variety of activities that were only preliminarily explored in these classes. These included strength training, yoga, pilates, stretching, qigong, and tai chi. Many residents also mentioned walking as an activity they enjoyed or would like to see in classes, and perhaps facilitated walking groups or other initiatives could be another way to engage residents in physical activity in a fun, sociable way. These remaining areas of interest present opportunities for future students as well as staff members to create more sessions to be administered at Bellwether, and to perhaps extend the reach of these classes to participants who are not necessarily older adults. The curriculums can serve as a template for adaptations, perhaps to appeal to families or other demographics with needs that differ from the population that these classes were originally designed for.

Additionally, there is still ample space for continued feedback and tailoring of these classes. While the pilot session of *Let’s Get Active* did elicit some positive feedback about the first class of the curriculum, there were several limitations to this method. There were a limited number of participants who attended (3 residents, 3 staff members) and participants were only exposed to one physical activity class rather than the entire set. The pilots were also conducted virtually due to the safety restrictions of the pandemic, which created some barriers. For example, Dorothy’s pilot session involved a cooking demonstration, which was well facilitated online, yet participants could not taste the food that was being prepared. It will be exciting and interesting to see how these classes translate to in-person environments. When the classes are delivered in-person at Bellwether, feedback from participants will be crucial for continued evolution of the classes and to ensure that they are best serving the population they were originally intended for. When classes are in person again, there will likely be increased opportunities for participants to share insights and feedback with staff members about what they did and did not enjoy, which can help with potential future changes to the curriculum. The success of the pilot classes among residents was promising, yet with larger class sizes in the future and different attendees coming to sessions, it will be necessary to continue editing and updating the curriculum as needed.

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**Appendices**

**Appendix A:**

**Nutrition and Activity Survey**

Hello! We are two graduate students at the University of Washington School of Public Health. We are conducting this survey to learn more about what types of nutrition and activity programs you would like to see at Bellwether. Your responses to this survey will help us create new nutrition, cooking, and/or activity classes at Bellwether. Your answers to this survey will be kept anonymous, but all participants in the survey will be entered into a raffle to win one of two $50 Safeway gift cards.

**Food and Nutrition**

Whole fruit:

1. How often do you eat fruit (not including juice)?

* *Daily*
* *5-6 times per week*
* *3-4 times per week*
* *0-2 times per week*

2. Are you interested in learning more about different types of fruit?

* *Yes*

If yes, are there types of fruits that interest you? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* *No*
* *Maybe*

3. Would you like to learn more about different ways to prepare fruit?

* *Yes*

If yes, what information would be helpful for you to prepare fruits?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* *No*
* *Maybe*

Vegetables:

1. How often do you eat vegetables?

* *Daily*
* *5-6 times per week*
* *3-4 times per week*
* *0-2 times per week*

2. Are you interested in learning more about different types of vegetables?

* *Yes*

If yes, are there types of types of vegetables that interest you?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* *No*
* *Maybe*

3. Would you like to learn more about different ways to prepare vegetables?

* *Yes*

If yes, what information would be helpful for you to prepare vegetables? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* *No*
* *Maybe*

Whole grains

1. How often do you usually eat whole-grain breads, cereals, rice, or pasta?

* *Daily*
* *5-6 times per week*
* *3-4 times per week*
* *0-2 times per week*

2. Are you interested in learning more about whole grains?

* *Yes*
* *No*
* *Maybe*

3. Would you like to learn more about different ways to prepare whole grains?

* *Yes*

If yes, what information would be helpful for you to prepare whole grains? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* *No*
* *Maybe*

Proteins

1. How often do you eat chicken or turkey?

* *Daily*
* *5-6 times per week*
* *3-4 times per week*
* *0-2 times per week*

2. Are you interested in cooking with chicken or turkey?

* *Yes*
* *No*
* *Maybe*

3. How often do you eat fish or seafood?

* *Daily*
* *5-6 times per week*
* *3-4 times per week*
* *0-2 times per week*

4. Are you interested in cooking with fish or seafood?

* *Yes*
* *No*
* *Maybe*

5. How often do you eat non-meat sources of protein, such as tofu, eggs, milk, nuts, or beans?

* *Daily*
* *5-6 times per week*
* *3-4 times per week*
* *0-2 times per week*

6. Are you interested in cooking with non-meat sources of protein?

* *Yes*
* *No*
* *Maybe*

7. What cooking techniques would you like to learn more about to prepare proteins? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Fats

1. What kind of fat do you typically use in cooking?

* *Olive Oil*
* *Canola Oil*
* *Other type of oil (please write in) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*
* *Butter*
* *Lard/other type of animal fat (please write in) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*

2. Are you interested in learning more about using healthful sources of fat in cooking?

* *Yes*
* *No*
* *Maybe*

Water

1. How many cups of water do you drink per day approximately?

* *0-2 glasses*
* *3-4 glasses*
* *5-6 glasses*
* *7+ glasses*

**Physical activity**

1. How often do you do exercises to increase muscle strength and endurance, such as lifting weights or push ups, etc.?

* *Daily*
* *5-6 times per week*
* *3-4 times per week*
* *0-2 times per week*

2. Are you interested in learning more about exercises that improve muscle strength and endurance?

* *Yes*

If yes, what exercises interest you? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* *No*
* *Maybe*

3. Have you ever participated in any other activities such as yoga, meditation, tai chi, stretching, etc?

* *Yes*

If yes, which activity or activities? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* *No*

If not, are you interested in learning more about or trying any of these activities and which one(s)? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Food Access and Preparation**

1. Which of these statements best describes the food eaten in your household in the last 12 months:

* *I have enough of the kinds of food I want to eat.*
* *I have enough, but not always the kinds of food I want to eat.*
* *I sometimes do not have enough to eat.*
* *I often do not have enough to eat.*

2. Where do you acquire the majority of your food from? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3. Do you feel confident about your ability to prepare foods from the foods you acquire at these locations?

* *Yes*
* *No*

4. What information might help improve your confidence to prepare balanced meals? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

5. Which of these statements best describes your ability to prepare food for yourself?

* *I prepare meals independently, mostly using different kitchen appliances such as the oven, stovetop, etc*
* *I prepare meals independently, mostly using a microwave oven or other quick preparation techniques*
* *I need help from someone else to prepare my meals*

6. Are you interested in learning more about how to prepare balanced meals using multiple kitchen appliances (such as the oven, stove)?

* *Yes*
* *No*
* *Maybe*

7. Are you interested in learning more about how to prepare balanced meals using a microwave or other quick preparation technique?

* *Yes*
* *No*
* *Maybe*

~End of Survey~

**Appendix B**

**Quantitative Survey Results**

|  |  |  |
| --- | --- | --- |
| **Fruit** | No. of Responses  | Percentage of Responses |
| Question 1: How often do you eat fruit? |
| 0-2 times per week | 16 | 14 |
| 3-4 times per week | 18 | 16 |
| 5-6 times per week | 17 | 15 |
| Daily | 63 | 55 |
| Total responses | 114 |   |
| Blank responses | 1 |   |
| Question 2: Are you interested in learning more about different types of fruits? |
| Yes | 81 | 72 |
| No | 23 | 21 |
| Maybe | 8 | 7 |
| Total | 112 |   |
| Question 3: Would you like to learn more about different ways to prepare fruit? |
| Yes | 53 | 50 |
| No | 41 | 38 |
| Maybe | 13 | 12 |
| Total | 107 |   |
| **Vegetables** | No. of Responses  | Percentage of Responses |
| Question 1: How often do you eat vegetables? |
| 0-2 times per week | 8 | 7 |
| 3-4 times per week | 24 | 22 |
| 5-6 times per week | 19 | 17 |
| Daily | 59 | 53 |
| Total responses | 110 |   |
| Blank responses | 5 |   |
| Question 2: Are you interested in learning more about different types of vegetables? |
| Yes | 70 | 66 |
| No | 32 | 29 |
| Maybe | 8 | 7 |
| Total | 110 |   |
| Question 3: Would you like to learn more about different ways to prepare vegetables? |
| Yes | 60 | 54 |
| No | 37 | 33 |
| Maybe | 15 | 13 |
| Total | 112 |   |
| Blank | 5 |   |
| **Grains** | No. of Responses  | Percentage of Responses |
| Question 1: How often do you usually eat whole-grain breads, cereals, rice, or pasta? |
| 0-2 times per week | 12 | 10 |
| 3-4 times per week | 23 | 20 |
| 5-6 times per week | 14 | 12 |
| Daily | 66 | 57 |
| Total responses | 115 |   |
| Blank responses |   |   |
| Question 2: Are you interested in learning more about different types of whole grains? |
| Yes | 60 | 58 |
| No | 29 | 28 |
| Maybe | 14 | 14 |
| Total | 103 |   |
| Question 3: Are you interested in learning more about different ways to prepare whole grains? |
| Yes | 44 | 49 |
| No | 30 | 33 |
| Maybe | 16 | 18 |
| Total | 90 |   |
| **Proteins** | No. of Responses  | Percentage of Responses |
| Question 1: How often do you usually eat chicken or turkey? |
| 0-2 times per week | 41 | 37 |
| 3-4 times per week | 50 | 45 |
| 5-6 times per week | 9 | 8 |
| Daily | 10 | 9 |
| Total responses | 110 |   |
| Blank responses | 5 |   |
| Question 2: Are you interested in cooking with chicken or turkey? |
| Yes | 56 | 50 |
| No | 37 | 33 |
| Maybe | 19 | 17 |
| Total | 112 |   |
| Question 3: How often do you eat fish or seafood? |
| 0-2 times per week | 69 | 64 |
| 3-4 times per week | 73 | 25 |
| 5-6 times per week | 6 | 8 |
| Daily | 8 | 6 |
| Total responses | 108 |   |
| Blank responses | 7 |   |
| Question 4: Are you interested in cooking with fish or seafood? |
| Yes | 64 | 58 |
| No | 34 | 31 |
| Maybe | 12 | 12 |
| Total | 110 |   |
| Question 5: How often do you eat non-meat sources of protein, such as eggs, milk, nuts, or beans? |
| 0-2 times per week | 10 | 9 |
| 3-4 times per week | 25 | 22 |
| 5-6 times per week | 21 | 19 |
| Daily | 57 | 50 |
| Total responses | 113 |   |
| Blank responses | 2 |   |
| Question 6: Are you interested in cooking with non-meat sources of protein? |
| Yes | 60 | 54 |
| No | 37 | 33 |
| Maybe | 15 | 13 |
| Total | 112 |   |
| **Food Security** | No. of Responses | Percentage of Responses |
| Question 1: Which of these statements best describes the food eaten in your household in the last 12 months? |
| I have enough of the kinds of food I want to eat. | 48 | 48 |
| I have enough, but not always the kinds of food I want to eat. | 45 | 44 |
| I sometimes do not have enough to eat | 3 | 3 |
| I often do not have enough to eat | 0 | 0 |
| Total responses | 101 |   |
| Blank responses | 14 |   |
| Question 5: Which of these statements best describes your ability to prepare food for yourself? |
| I prepare meals independently, mostly using different kitchen appliances such as the oven, stovetop, etc. | 82 | 68 |
| I prepare meals independently, mostly using a microwave oven or other quick preparation techniques. | 27 | 23 |
| I need help from someone else to prepare my meals. | 11 | 9 |
| Total | 120 |   |
| Question 6: Are you interested in learning more about how to prepare balanced meals using multiple kitchen appliances (such as the oven, stove)? |
| Yes | 41 | 39 |
| No | 40 | 38 |
| Maybe | 23 | 22 |
| Total responses | 105 |   |
| Blank responses | 10 |   |
| **Physical Activity** | No. of Responses | Percentage of Responses |
| Question 1: How often do you do exercises to increase muscle strength and endurance, such as lifting weights or push ups, etc.? |
| 0-2 times per week | 45 | 45 |
| 3-4 times per week | 23 | 23 |
| 5-6 times per week | 5 | 5 |
| Daily | 25 | 25 |
| Total responses | 100 |  |
| Blank responses | 15 |  |
| Question 2: Are you interested in learning more about exercises that improve muscle strength and endurance? |
| Yes | 63 | 61.1 |
| No | 22 | 21.4 |
| Maybe | 18 | 17.5 |
| Total responses | 103 |  |
| Blank responses | 12 |  |
| Question 3: Have you ever participated in any other activities such as yoga, meditation, tai chi, stretching, etc? |
| Yes | 53 | 55 |
| No | 44 | 45 |
| Total responses | 97 |  |
| Blank responses | 18 |  |

**Appendix C**

**Qualitative Survey Results: Survey Summary Statements**

**Fruits**: 112 residents responded to the question “Are you interested in learning more about different types of fruits?” 72% of respondents were interested in learning more about different types of fruits. There were a variety of fruits that were of interest. However, the most commonly reported fruit that residents wanted to know more about was apples. In addition, there was interest in a wide array of imported fruits, such as Asian fruits and tropical fruits like bananas, dragon fruit, and mangoes as well as notable interest in several types of melons and citrus. 107 residents responded to the question “Would you like to learn more about different ways to prepare fruit?” 49.5% responded yes. Preparation techniques that people were interested in learning included smoothie making (4 responses), how to stew fruit (3 responses), how to store fruit, and how to add more fruit to meals and cook with it.

**Vegetables**: 110 residents responded to the question “Are you interested in learning more about different types of vegetables?” 64% said yes. Types of vegetables that residents were interested in learning about included green vegetables (bok choy, spinach, cabbage, lettuce, kale, green beans, broccoli) and Asian vegetables (yu choy, long beans, Asian gourds). However, many residents expressed interest in learning about a variety of vegetables, rather than specific ones. 112 residents responded to the question “Would you like to learn more about different ways to prepare vegetables?” 53% said yes. 3 respondents requested to learn more about stir fry techniques, 6 respondents requested to learn about water based cooking techniques (steaming, water sauteing, no fat), and 4 respondents requested more information about how to flavor vegetables. 5 respondents requested this information to be delivered via the Internet and social media.

**Grains**: 90 residents responded to the question “Are you interested in learning more about different ways to prepare whole grains?” 49% said yes. Several residents requested to learn more about ancient grains and gluten free grains. The main theme of the responses were that residents wanted to learn about a variety of grains. Two respondents requested to learn about grains that would not spike their blood sugar.

**Protein**: 32 residents answered the question “What cooking techniques would you like to learn more about to prepare proteins?” Responses were varied, however, several residents requested to learn how to improve the flavorful profile of protein, especially tofu. There was a demonstrated interest in learning about a variety of cooking techniques for proteins, including use of the microwave, stir fry, baked, boiled, and other ideas.

**Fat**: 57% of respondents wanted to learn more about different types of fat.

**Exercise**: 103 residents responded to the question “Are you interested in learning more about exercises that improve muscle strength and endurance?” 61% said yes. Many residents were interested in walking, weight/strength training, abdominal exercises, and total body training as forms of exercise. One resident also requested easy workouts for arthritic joints, and several residents requested low impact/intensity workouts for older adults as well as more about solo workouts to do at home. 97 residents responded to the question: “Have you ever participated in any other activities such as yoga, meditation, tai chi, stretching, etc?” 55% said yes, 45% said no. For those who said yes, exercises that were most common included yoga, stretching, tai chi, walking and meditation. For the residents who did not participate in these other activities, there was a demonstrated interest in learning more about them, specifically including activities like yoga, meditation, tai chi, stretching and basic muscle strengthening.

**Food access/preparation**: Most residents who wrote in reported that they purchased at least some of their foods at various grocery stores, like Safeway or QFC, and many acquired their food from several locations, such as a grocery store and food bank or with EBT.

**Appendix D**

**Main Curriculums Reviewed**

|  |  |  |
| --- | --- | --- |
| **Curriculum Name** | **Overview**  | **Website/Source** |
| **USDA: Eat Smart, Live Strong** | Four main lessons designed to improve fruit and vegetable consumption for low income, community dwelling older adults  | Eat Smart, Live Strong Project Overview. Published online March 2013. Accessed March 26, 2021. <https://snaped.fns.usda.gov/sites/default/files/documents/ProjectOverview19.pdf> |
| **Leah’s Pantry: Food Smarts** | Offers multiple lesson plans suitable for low-income youth, adults, and older adults  | Food Smarts Curriculum. Leah’s Pantry. Published 2021. Accessed March 26, 2021. <https://www.leahspantry.org/what-we-offer/cultivate-nourished-communities/food-smarts-curriculum/> |
| **USDA: Eating Smart, Being Active** | Eight classes designed to encourage healthy eating and physical activity   | Natker E, Baker S, Auld G, McGirr K, Sutherland B, Cason K. Formative Evaluation of EFNEP Curriculum: Ensuring the Eating Smart • Being Active Curriculum Is Theory Based. J Ext. 2015;53(1):15. |

**Appendix E**

**Curriculum -** To access the complete instructor guide, click [here](https://docs.google.com/document/d/1342B3JMGDmyoOQP7o04DqMzTb2r-pTu4PavNzUwq-TY/edit?usp=sharing).