

A Research Proposal: Use of Annual Nutrition Education  
Reinforcement to Decrease Childhood Obesity

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### Abstract

The prevalence of childhood obesity has nearly quadrupled from 5.2% to 19.3% in the last 50 years. Many interventions and studies have been proposed and implemented to reduce the prevalence of childhood obesity. The Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) is a federally funded program that has helped to reduce the prevalence of childhood obesity in children ages 2- to 4-years old; however, there is still more that can be done to reduce the prevalence of childhood obesity. The purpose of this proposed study is to determine the effects of annual nutrition education reinforcement sessions (ANERS) for mothers on the reduction of children's BMI-for-age z-scores compared to parents/dietary gatekeepers who do not receive ANERS. Additionally, this proposed study will determine the effects of ANERS on the average number of servings of fruits and vegetables (F&V) that children consume outside of school meals in comparison to the average number of servings of F&V consumed outside of school meals by children whose mothers do not receive ANERS. It is anticipated that 200 mother-child dyads, previously in the WIC program, will participate in this proposed study, with mothers randomized into either the intervention group or the control group. The intervention group will receive annual nutrition education reinforcement sessions with an assigned dietitian after their children's well-child visit. The control group will not receive annual nutrition education reinforcement sessions. It is anticipated that there will be a significant difference in children's BMI-for-age z-scores in year two (1.16,  $\pm 0.14$  and 1.30,  $\pm 0.11$ , respectively;  $p = .050$ ) and year three (1.07,  $\pm 0.18$  and 1.28,  $\pm 0.12$ , respectively;  $p = .025$ ). It is also anticipated that in year three of the study, children in the intervention group will have a significantly greater average consumption of F&V outside of school meals than children in the control group (14.0,  $\pm 1.8$  and 11.3,  $\pm 2.2$ , respectively;  $p = .042$ ). The proposed study will be a

step towards reducing the prevalence of childhood obesity by providing mothers an opportunity to be counseled and to get healthy eating reinforcement annually.

*Keywords:* Nutrition education, childhood obesity, parents, interventions

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## Table of Contents

<b>Abstract.....</b>	<b>2</b>
<b><i>Keywords:</i> .....</b>	<b>3</b>
<b>Acknowledgements .....</b>	<b>4</b>
<b>Chapter 1: Introduction .....</b>	<b>8</b>
Problem Statement .....	11
Purpose of Study .....	11
Research Questions & Hypotheses .....	12
Nature of the Study .....	13
Definitions .....	15
Assumptions .....	15
Limitations .....	16
Delimitations .....	16
Significance .....	17
Summary .....	17
<b>Chapter 2: Review of Literature .....</b>	<b>19</b>
Introduction .....	19
Literature Research Strategy .....	20
Background .....	20
Role of Dietary Gatekeepers.....	20
Interventions .....	24
Prenatal interventions for preventing childhood obesity .....	25
Family-based Behavioral Weight Loss Treatment (FBT) .....	26
Interventions targeting dietary gatekeepers for healthy food intake .....	29
Interventions specifically targeting children and not the dietary gatekeeper .....	34
Research Methodology.....	36
Summary .....	38
<b>Chapter 3: Methodology.....</b>	<b>41</b>
Research Protocol.....	42
Research Question 1 .....	42
Research Question 2 .....	42
Study Design .....	44

Setting and Sample Size .....	45
Randomization.....	48
Data Collection Process .....	48
Intervention.....	48
Instrumentation .....	50
Data Analysis Plan .....	51
Descriptive Statistics .....	51
Inferential Statistics .....	52
Threats to Validity.....	53
Ethical Procedures.....	53
Summary .....	54
<b>Chapter 4: Anticipated Results.....</b>	<b>56</b>
Characteristics of the Study Sample.....	56
Child Anthropometrics.....	59
Weekly Servings of Fruits and Vegetables Consumed by Children Outside of School Meals	60
Summary .....	61
<b>Chapter 5: Discussion .....</b>	<b>62</b>
Interpretation of Results .....	62
Characterization of the Study Population.....	63
BMI-for-age Z-Score Outcomes .....	63
Weekly Servings of Fruits and Vegetables Served to Children Outside of School Meals .....	64
Comparison to Other Studies .....	65
Strengths and Limitations.....	66
Suggestions For Future Studies.....	67
Conclusion.....	68
<b>References.....</b>	<b>69</b>
<b>Appendix A.....</b>	<b>76</b>
<b>Appendix B.....</b>	<b>102</b>
<b>Appendix C.....</b>	<b>124</b>
<b>Appendix D.....</b>	<b>125</b>
<b>Appendix E.....</b>	<b>128</b>
<b>Appendix F.....</b>	<b>130</b>

<b>Appendix G.....</b>	<b>131</b>
<b>Appendix H.....</b>	<b>133</b>
<b>Appendix I. ....</b>	<b>134</b>
<b>Appendix J.....</b>	<b>135</b>

### **List of Tables**

Table 1 .....	43
Table 2 .....	52
Table 3 .....	58
Table 4 .....	59
Table 5 .....	60

### **List of Figures**

Figure 1 .....	57
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## Chapter 1: Introduction

In the past 50 years, the prevalence of obesity among children in the United States (US) has nearly quadrupled from 5.2% to 19.3% (Centers for Disease Control and Prevention, 2021). According to the 2017 – 2018 National Health and Nutrition Examination Survey (NHANES), 19.3% of United States children and adolescents ages 2 – 19 years are obese. This percentage is a 0.8% increase from the data collected from 2015-2016 at 18.5%; however, it is still concerning that the trend on childhood obesity continues to increase ever since data collection on overall obesity began between 1971 and 1974.

Childhood obesity is a risk factor of adult obesity, chronic health conditions as adults, and premature death (Ahmad et al., 2010). Up to 80% of overweight adolescents will become obese adults. According to the Centers for Disease Control and Prevention (CDC), the prevalence of adult obesity has increased from 30.5% from 1999-2000 to 41.9% from 2017 to 2020 (CDC, July 2022). This trend in increasing obesity prevalence among adults falls in line with what researchers projected in which 51% or more of US adults will be obese by 2030 (Wang et al., 2008).

The cost of healthcare continues to increase as obesity and chronic health conditions become more prevalent in the US. According to the Centers for Medicare and Medicaid Services (2021), the national health expenditure (NHE) increased to \$4.1 trillion in 2020 from \$3.8 trillion in 2019. The unexpected COVID-19 pandemic could have had an impact on the NHE, however the NHE is projected to grow at an average annual rate of 5.4% between 2019 and 2028. Although obesity is not the only factor increasing the NHE, reducing the prevalence of obesity in children may help to reduce the projected NHE years from now.

## Background

Body mass index (BMI) ranges are used to categorize an individual's weight status as underweight, healthy weight, overweight, obese, or severely obese. A BMI is an anthropometric measurement calculated by dividing a person's weight in kilograms by their height in meters, squared. In children, classification of BMI is based on standardized growth measures which are defined using either BMI percentiles or BMI z-scores. A BMI percentile ranks a child's position in relation to a reference group (Anderson et al., 2017). BMI z-scores are standard deviation scores that illustrate where an observation falls within a number of standard deviations of the mean BMI on the Child Growth Standards charts. According to the Centers for Disease Control and Prevention (December 2022), a pediatric BMI-for-age percentile of 85% to under 95% is considered overweight, while a BMI-for-age percentile greater than or equal to 95% is interpreted as obese, and a BMI-for-age range greater than or equal to 120% of the 95<sup>th</sup> percentile is considered severe obesity. A BMI z-score equivalent of the 85<sup>th</sup> to under 95<sup>th</sup> percentiles (overweight classification) would be 1.036 to 1.644 and a BMI z-score equivalent to the obese and severe obese classification would be 1.645 and greater. Children's BMIs are influenced by multiple variables such as their mother's weight status, their mealtime habits, and their socioeconomic background.

Children with mothers that have a higher BMI and gestational weight gain are at increased risk of childhood weight gain or obesity at 4-years of age (Josey et al., 2019). Maternal obesity can affect the weight status of her offspring through intrauterine mechanisms like excessive gestational weight gain. Josey and colleagues found that maternal BMI was associated with an overall BMI z-score increase of 0.04 in offspring.

Additionally, children's food and mealtime habits influence their weight status. Their food and mealtime habits are influenced by dietary gatekeepers (people who choose what foods to buy, to keep in the house, and to feed the children) and children carry these habits into adulthood. These habits can have either positive or negative health effects.

In addition to the influence of maternal obesity on children's weights, a dietary gatekeeper's ability to provide healthier diets for their child is influenced by their gender, age, education level, BMI, and presence of disease (Wijayarathne et al., 2018). Internal factors that affect a gatekeeper's ability to provide healthy food are their cooking confidence, nutrition confidence, parental stress, parental depression, and parental self-efficacy (PSE) (Ek et al., 2021; Reid et al., 2015). Many studies have been conducted to reduce the prevalence of childhood obesity through the use of intervention-based programs with dietary gatekeepers (Döring et al., 2021; Fulkerson et al., 2018; Jastreboff et al., 2018).

The 2017-2018 NHANES report showed that children ages 6 to 19 years old have a higher prevalence of obesity compared to children of younger aged groups, 20.7% and more compared to 12.7%, respectively (Centers for Disease Control and Prevention, 2021). Children who come from lower socioeconomic backgrounds are more likely to be obese than those from higher socioeconomic backgrounds (Centers for Disease Control and Prevention, November 2022). The Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) is a federal program that promotes healthy eating and nutrition education for infants and children up to age 5 and women with low incomes who are pregnant, postpartum, or breastfeeding. The CDC and US Department of Agriculture (USDA) have found that in 2020, 14.4% of national WIC participants ages 2-4 years old had obesity compared to 15.9% in 2010. This negative trend

in obesity brings hope in reducing the prevalence of obesity through federally supported programs like WIC.

WIC program benefits for children end at age 5 and the prevalence of obesity is greater in children ages 6-19; therefore, there is still more that can be done to advance the reduction of childhood obesity. The Supplemental Nutrition Assistance Program and its accompanying education program, SNAP-Ed, provides additional nutrition support (U.S. Department of Agriculture, 2021); however, unlike WIC, the education program is optional. There has yet to be a program similar to WIC that is designed to provide annual support for healthy eating in children after the age of 5.

### **Problem Statement**

Intervention programs and relearning opportunities to help parents and children develop and continue healthy dietary patterns are needed since many intervention programs are limited in duration (Røed et al., 2021). There is limited evidence demonstrating how programs with relearning opportunities can reduce the risk of childhood obesity and improve children's meal time habits.

### **Purpose of Study**

The purpose of this randomized controlled trial is to determine the effects of annual nutrition education reinforcement sessions (ANERS) for parents/dietary gatekeepers on the reduction of children's BMI-for-age z-scores when compared to parents/dietary gatekeepers who do not receive ANERS. This study will also determine the effects of ANERS for parents/dietary gatekeepers on the number of servings of fruits and vegetables (F&V) that their children

consume outside of school meals in comparison to the number of servings of F&V consumed outside of school meals by children whose parents do not receive ANERS.

### **Research Questions & Hypotheses**

Q<sub>1</sub>: Will annual nutrition education reinforcement sessions for dietary gatekeepers result in lower child BMI-for-age z-scores compared to participants not receiving annual nutrition education reinforcement sessions?

H<sub>01</sub>: Annual nutrition education reinforcement sessions for dietary gatekeepers will have no effect on child BMI-for-age z-scores.

H<sub>a1</sub>: Children whose parents/dietary gatekeepers receive annual nutrition education reinforcement sessions will have lower BMI-for-age z-scores compared to children whose parents/dietary gatekeepers do not receive annual nutrition education reinforcement sessions upon follow-up assessments.

Q<sub>2</sub>: Will annual nutrition education reinforcement sessions result in greater number of servings of fruits and vegetables consumed outside of school meals weekly by children whose parents/dietary gatekeepers receive annual nutrition education reinforcement sessions compared to children whose parents/dietary gatekeepers do not receive the annual nutrition education reinforcement sessions?

H<sub>02</sub>: Annual nutrition education reinforcement sessions will have no effect on the number of servings of fruits and vegetables consumed weekly by children whose parents/dietary gatekeepers receive annual nutrition education reinforcement sessions compared to

children whose parents/dietary gatekeepers do not receive annual nutrition education reinforcement sessions.

H<sub>a2</sub>: Annual nutrition education reinforcement sessions will result in a greater number of servings of fruits and vegetables consumed weekly outside of school meals by children whose parents/dietary gatekeepers receive annual nutrition education reinforcement sessions compared to children whose parents/dietary gatekeepers do not receive annual nutrition education reinforcement sessions.

### **Nature of the Study**

Nutritionists in the WIC program in Milwaukee, Wisconsin will be asked to refer mothers that are already participating in WIC and whose children will soon age out of the WIC program. Mothers in WIC with children who are 4 years old will be referred to participate in the study. Inclusion criteria of mothers consist of their child being overweight or obese, having a BMI-for-age in the 85<sup>th</sup> percentile or greater, being 4-5 years old, and living in Milwaukee, Wisconsin. If mothers have more than one child, only their children who are 4-5 years old at the time of the initial program enrollment will be included in the data analysis. Exclusion criteria for mothers consist of health conditions that alter the nutritional needs of their children or their children does not live with them. Upon becoming eligible and signing an informed consent form, all mothers will participate in a four-week intervention program called *MyPlate for My Family*, hosted at the Hunger Task Force. They will all take a pre-survey to collect their demographic and socioeconomic data, and to collect baseline data on fruit and vegetable intake. Pre-surveys will be given as hard copies for mothers to fill out at the start of the *MyPlate for My Family* program

and will be kept locked in a secured filing cabinet at the Hunger Task Force. Children's age and anthropometric measurements will be collected through their electronic health record.

Dietitians will be recruited through the distribution of information leaflets and emails across Advocate Aurora's network of outpatient dietitians in the Milwaukee area in January of 2024. One dietitian at five different clinic locations will be selected for the study. If required, out-of-network dietitians will be recruited as contractors and will be compensated \$1,000 at the end of every year during the duration of the study, which will be funded by the Advocate Aurora Health Research Institute. During the first year, dietitians will attend a one-hour seminar to be trained in implementing counselling and education sessions for the study participants according to a standardized protocol. Starting in April of 2024, WIC nutritionists will recruit mothers with children that are four years old. This recruitment process will be open enrollment and will end when there is an adequate number of participants recruited at each clinic. Participants will then be randomly selected to participate in the intervention group, which will receive annual nutrition education reinforcement sessions, or to be in the control group, which will only receive the routine well-childcare in the annual clinic setting.

Annual nutrition education reinforcement sessions will take place virtually after a mother has taken their child for their annual well-child visit. The child's healthcare provider will create a note on Epic (Advocate Aurora's electronic health record system) that refers the mother-child dyad to their assigned dietitian. This note will alert the dietitian that their mother-child dyad has completed their annual well-child visit. Dietitians will then send reminders to mothers to schedule an annual nutrition education reinforcement session and will schedule a virtual zoom meeting so that mothers will be able to meet from the comfort of their home. Children's age in

months, height, and weight will be collected from their electronic health record after their annual well-child visit. Their BMI-for-age z-scores will be calculated using the SAS Program for CDC Growth Charts (Centers for Disease Control and Prevention, January 2023).

In this proposed study, Chi-square will be used to analyze the differences of mothers' ages, gender of children, race/ethnicity, education level between the control and the intervention groups at baseline. This statistical analysis tool will be able to determine if the randomized groups are similar or not before the interventions begin. An independent t-test will be used to compare the pre-program, post-program, and annual BMI-for-age z-scores of the control group and the intervention groups. An independent t-test will also be used to determine the differences between average number of servings of F&V consumed outside of school meals from the control group and the intervention group at each data collection point.

### **Definitions**

**Dietary Gatekeeper:** the member of a household who is mainly responsible for purchasing food, cooking meals for children, and shaping the dietary preferences of children in the household (Reid et al., 2015)

**ANERS:** Annual nutrition education reinforcement sessions

### **Assumptions**

All participants will answer questionnaires honestly and participants will actively engage in education/discussion sessions. There will be adequate numbers of participants and dietitians willing to participate. All participants will have access to a computer or mobile device and internet for virtual meetings. All participants in the intervention group and meeting a dietitian virtually will be free of distractions wherever they meet from. Dietitians will provide similar

nutrition education interventions in all clinics. The height and weight of children will be accurately recorded to determine the correct BMI-for-age of each child. The child's mother will be their primary dietary gatekeeper.

### **Limitations**

One limitation of this proposed study is that individualized nutrition education will differ for each participant in the intervention group based on their needs and based on their dietitian. Additionally, retention rate may decrease throughout the duration of the study and participants may drop out due to unforeseen health conditions and new diagnoses. This could cause results to skew in one direction because of the possibility of less participants in one group compared to the other. Another limitation is that parts of the intervention will take place virtually. A lack of in-person interaction may create disinterest and contribute to a decreased retention rate. This study will take place in Milwaukee, Wisconsin, therefore, it may not be representative of all demographics or of other locations in the United States. The demographic of Milwaukee is another limitation, as Milwaukee is known to be one of the most segregated cities in the nation. The demographic of the study sample may be disproportionate to the population of Milwaukee based on the locations of participating clinics.

### **Delimitations**

The inclusion of mothers and children who are WIC eligible is a delimitation in this study. This study will not pertain to mothers and children who were not WIC eligible. Additionally, participants must live in Milwaukee, Wisconsin, thus being a delimitation in this study. Another delimitation is the inclusion of mothers whose children have a BMI-for-age in the 85<sup>th</sup> percentile or greater and the exclusion of mothers whose children have a BMI-for-age less

than the 85th percentile. A fourth delimitation is that this study excludes mothers whose children may be in foster care or living with someone other than their mother, and therefore, does not address and is not representative of them.

### **Significance**

Results from this study can create new dialogue for normalizing annual nutrition education reinforcement sessions (similar to annual health check-ups). Additionally, it would be able to provide evidence-based support for nutrition intervention programs after parents and their children age out of the WIC program. The WIC program has already helped reduce the prevalence of obesity in children ages 2-4 from 15.9% in 2010 to 14.4% in 2020 (Centers for Disease Control and Prevention, November 2022). By pursuing further interventions to reduce the prevalence of obesity among children, there is an increased chance of being able to decrease the risk of chronic health conditions and premature deaths that the US may face.

### **Summary**

As the trend for childhood obesity in the US continues to increase, it is crucial to address this epidemic and explore effective interventions to reduce its prevalence. This proposed study aims to explore the effect of an intervention program with annual nutrition education reinforcement sessions on the prevalence of childhood obesity, starting with a small population from Milwaukee, Wisconsin. The results of this study would indicate if annual nutrition education reinforcement sessions can aid the reduction and prevention of child obesity in low-income communities. The following chapter will review the literature and evidence on nutrition-focused interventions to reduce the prevalence of childhood obesity. Furthermore, chapter three

will review in more detail the study design of this proposed study and chapters four and five will discuss possible results and conclusions of this study.

## **Chapter 2: Review of Literature**

### **Introduction**

Childhood obesity has been a worldwide concern for many decades. Children who are obese, as compared to those who are classified as healthy weight by BMI-for age, are at greater risk of continuing to be obese as adults (Josey et al., 2019). These children also become more susceptible to developing several chronic health conditions like hypertension, hyperlipidemia, diabetes, and cardiovascular disease. The cost of secondary and tertiary prevention methods is far greater than the cost of primary prevention methods. According to the Centers for Medicare and Medicaid Services (2021), the national health expenditure increased to \$4.1 trillion in 2020. With obesity on the rise, the cost of healthcare in the United States does not seem to have a chance at decreasing.

According to the 2017-2018 National Health and Nutrition Examination Survey (NHANES), about 19.3% of U.S. children and adolescents aged two to nineteen years are obese. NHANES also revealed an estimated 6.1% of U.S. children and adolescents have severe obesity and that 16.1% are overweight (Centers for Disease Control and Prevention, 2021). In 2017-2018, the prevalence of obesity in boys ages two to five, six to eleven, and twelve to nineteen was 14.7%, 21.3% and 22.5%, respectively. The 2017-2018 NHANES also reported the prevalence of obesity in girls ages two to five, six to eleven, and twelve to nineteen as 12.2%, 19.2%, and 19.9%, respectively. The results show that children ages six to nineteen have a higher prevalence of obesity than other age groups and that boys have a higher prevalence of obesity than girls. The statistics on childhood obesity point toward a need to reduce prevalence of obesity in children; however, interventions targeted toward children may not be as effective as

interventions towards their dietary gatekeepers such as their parents or guardians. This literature review will walk readers through understanding the role and influence of dietary gatekeepers, barriers that impact a dietary gatekeeper's ability to prepare healthy meals, and how intervention programs directed towards parents and guardians, families, and kids affect the prevalence of childhood obesity.

### **Literature Research Strategy**

“Dietary gatekeeper” was the key search topic in the beginning stages of this research process. This term was entered into the Mount Mary Library Primo search tool as well as PubMed Central. Very few results populated; however, these results yielded studies on interventions for dietary gatekeepers, food literacy, healthy eating barriers, and household diet. After reviewing the limited articles available, the key terms “parents AND healthy eating” were also searched on PubMed/MEDline. Similarly, there were limited articles available in regard to the key search terms. The literature available pointed towards parent interventions to reduce the prevalence of childhood obesity and to increase consumption of F&V in children. “‘Parents’ AND ‘Childhood obesity’” was another key term that was searched on PubMed/MEDline and the Mount Mary Primo search tool. Filters used for all searches included articles that were peer-reviewed articles published within the last seven years.

### **Background**

#### ***Role of Dietary Gatekeepers***

To better understand the prevalence and prevention of childhood obesity, it is important to understand the role of dietary gatekeepers in providing meals and social learning experiences for children. While children are young, they often do not have control of the foods they eat or the

foods to which they have access. Dietary gatekeepers, whether their mother, father, or guardian, play a big role in the nutritional health of children. They shape the food preferences and mealtime habits that their children develop and carry into adulthood (Reid et al., 2015; Wijayaratne et al., 2018). These food and mealtime habits can cause either positive or negative health effects depending on what types of habits have been created. In an article by Wijayaratne et al. (2018), researchers examined how food literacy and barriers to healthy eating affected dietary gatekeepers' intention to prepare healthy meals for their families and how satisfied they were with the healthiness of their diet. Researchers in this study also looked at dietary gatekeepers' intent to supply healthier diets. They found that a dietary gatekeeper's intent to supply healthier diets was influenced by their BMI and that food literacy was more likely to be influenced by being female, older in age, having a higher education, lower BMI, and having a disease present. These characteristics in dietary gatekeepers seem to be associated with having an increased desire for providing healthier meals.

The impact of a dietary gatekeeper on their children is important because they are the primary influencers over the development of future preferences and behaviors of their children. Researchers in a Dutch study, in which 667 adolescents between the ages of 10- and 14.8- years old were recruited, found that children's food intake was significantly and positively associated with their exposure to their mother's food intake of both healthy and unhealthy foods obtained from home in comparison to the child's exposure to their best friend's food intake (van den Broek et al., 2020). As a child was exposed to their mother eating more F&V, their intake of F&V also increased. Additionally, as a child was exposed to their mother eating more discretionary foods, their discretionary food intake also increased. On the other hand, the association between a child's food intake and exposure to their best friend's food intake was

nonsignificant (van den Broek et al., 2020), thus supporting the concept that a child's mother plays a bigger role in shaping their food preferences than a friend does. Van den Broek et al., (2020) also suggests that social learning effects, including modeling, is a potential explanation for mother-child food intake similarities.

Dietary gatekeepers also serve as role models to their children by choosing foods for their children to eat. Dietary gatekeepers are called gatekeepers because they are the people who choose what foods to buy, to keep in the house, and to feed the children. Because of the greater prevalence of obesity among boys compared to girls, Bouhlal et al. (2015) aimed to identify if the food choice behaviors of mothers were affected by their child's gender. Researchers discovered that mothers spent more time choosing the foods their daughters ate in comparison to the foods their sons ate. Mothers chose more kilocalories for their sons. This finding fell in line with the suggestion from the American Heart Association that boys should consume 1400 kcal per day and girls should consume 1200 kcal per day. However, upon analyzing food choices, researchers discovered that the boys' plates were filled with more calorie-dense foods as compared to girls' plates which had healthier foods (Bouhlal et al., 2015). These findings suggest the possibility that mothers feel the need to restrict food intake for their daughters but not necessarily for their sons. The food choices that mothers make on behalf of their sons and daughters could lead to life-long patterns of consuming calorie-dense foods or healthier foods. This can either increase or decrease the risk of obesity, respectively.

The role of a dietary gatekeeper is crucial to developing healthy food choice behaviors in children; however, developing healthy behaviors is not as easy as it sounds. In fact, the attitudes, capabilities, and practices of individual gatekeepers affect their ability to choose foods and make

meals for their family. Reid et al. (2015), examined the connections between the cognitions, food-related capabilities and practices of the dietary gatekeeper, and their satisfaction with how healthy their family diet is. Three hundred and twenty three Australian dietary gatekeepers and 326 American dietary gatekeepers were recruited to participate in this study from Global Market Insight, an online marketing research company. Reid et al. (2015) found that gatekeeper confidence in nutrition and cooking was associated with the ability to buy healthier foods and transform them into healthy meals. Additionally, cooking confidence and nutrition confidence of dietary gatekeepers reinforced their ability to exert control over what their family eats. Being able to buy healthy foods, create healthy meals, and have enough time to cook the meals are all necessary components to creating healthier food intake behaviors in children. When dietary gatekeepers are not confident in their ability to provide these components, children are less likely to consume healthy foods.

Parental stress is also a barrier to healthy dietary behaviors that can be addressed in intervention programs. Jastreboff et al. (2018) assessed a mindfulness-based parent stress intervention in low-income parents with obesity to decrease the risk of early childhood obesity. Participants in the intervention group participated in an intervention program called Parenting Mindfully for Health and also received counseling for nutrition and physical activity (abbreviated as PMH + N) to help prevent obesity in 2- to 5-year-olds at risk of developing obesity. They met on a weekly basis for eight weeks in a 2-hour group setting to discuss content on cultivating mindfulness and applying strategies of awareness, distancing with awareness, diverting attention, and deflecting and reflecting. Participants in the control group did not receive the parenting with mindfulness intervention program; however, they did receive the same nutrition and physical activity intervention. In place of the mindfulness program, participants in

the control group watched nature videos and discussed the videos in their weekly 2-hour sessions over the course of eight weeks. The study found that PMH + N reduced stress for parents and had a significant impact on parenting behaviors by increasing parent involvement with their children and significantly reduced emotional eating among parents in the PMH + N group. The nutrition component of PMH + N and the control group were equally effective in improving parents' healthy eating scores. These results suggest that either nutrition intervention would be able to improve the healthy eating scores of the parents; however, addressing parental stress and providing parents the tools and strategies to deal with stress positively impacts their relationship with their children and reduces emotional eating in the parents.

Parental depression is another factor that can influence a gatekeeper's selection of foods in their household. Ek et al. (2021) studied the influence of parental depression on child weight status, eating behaviors, and parental feeding practices during childhood obesity treatment. They found that parental depression is associated with obesity-related child eating behaviors but it did not influence child weight status or parental feeding practices (Ek et al., 2021). This study suggests that parental depression does not affect the child's weight status or their feeding practices, however it is associated with obesity-related child eating behaviors. It also raises the question: "is food a coping mechanism for the parents and thus reflected onto the children?" Although parental depression does not directly influence a child's weight, children may mirror their parents' eating habits.

### ***Interventions***

It is important to provide effective interventions to decrease the prevalence of childhood obesity. Nutrition counseling is one intervention approach that can be used to help individuals

improve their diets. Taveras et al. (2017) compared the effects of a one year enhanced primary care intervention (control group) to the effects of a one year enhanced primary care with nutrition coaching intervention (intervention group). All participants received monthly resources as web links and handouts; however, only participants in the intervention group received in-person coaching. Enhanced primary care consisted of clinical decision support tools to provide families with educational materials for self-guided behavior change support. They found that enhanced primary care with coaching led to improvements in quality of life but did not have a significantly greater effect on child BMI when compared with the enhanced primary care without coaching group. Both groups had improved child BMIs, showing that both interventions were capable of improving BMI scores of children. Nutrition counseling is beneficial for patients and clients interested in making healthy changes in their diet; however, the cost of nutrition counseling may be more than some can afford. This study shows that providing patients with the resources to make healthier habits can be effective in lowering BMI without in-person nutrition counseling.

### ***Prenatal interventions for preventing childhood obesity***

Interventions for parents with children who are a few months to a few years old are common; however, providing interventions before a child is born to help reduce the prevalence of childhood obesity is quite uncommon. The premise of this study is that by providing resources for lifestyle change before a child is born, parents will have the time to practice improving their dietary habits and increasing their physical activity levels. The GeliS trial is an ongoing study that is currently investigating the effects of prenatal life-style interventions on long-term child development (Spies et al., 2022). The study consists of 2286 mothers and their children. Mothers in this study had excessive gestational weight gain (GWG). The control group consisted of the

mothers who had excessive GWG and received routine care. The experimental group consisted of the mothers who had excessive GWG and received routine care along with comprehensive counselling. Mothers in the experimental group were given comprehensive counselling to limit excessive GWG and improve dietary and physical activity behavior. Spies et al. (2022) followed-up on the effects of the prenatal interventions on child anthropometrics and child neurodevelopment at 2 to 3 years of age. They observed no significant differences among both control and experimental groups. This trial will continue to follow participants up until the children are 5 years old to observe any effects of the prenatal intervention. This trial currently suggests that there are no long-lasting effects of the prenatal intervention on child anthropometric measurements. Spies et al. (2022) noted several limitations in the GeliS trial, including that socioeconomic status was not collected and that anthropometric measurements were not collected alongside routine care which may have affected outcomes because of a lack of standardization. A study containing standardized anthropometric measurements and collection of socioeconomic status would be useful for comparing the long-term effects of intervention programs aiming to reduce the prevalence of childhood obesity.

### ***Family-based Behavioral Weight Loss Treatment (FBT)***

Intervention strategies for childhood obesity include community and health programs offering a family-based behavioral weight loss treatment (FBT). FBT programs involve parents and children in the intervention process. Hayes et al. (2019) examined how home food environments were associated with child weight and weight-related outcomes before and after an FBT intervention program conducted by Wilfley et al. (2017). The FBT program utilized the Traffic Light system, which placed foods and activities into RED or GREEN categories. RED foods and activities consisted of high-energy dense foods and screen time. GREEN foods and

activities consisted of low-energy dense foods and moderate-to-vigorous physical activity (MVPA). After the FBT program, families were able to create healthy home environments and improve child weight and weight related outcomes by reducing RED foods in the home environment (Hayes et al., 2019). They also found that increasing the availability of GREEN foods without decreasing RED foods in the home may not be enough to improve weight and consumption patterns. This study demonstrated the impact of a dietary gatekeeper's ability to impact their child's diet quality by not only increasing GREEN foods and activities, but by also removing RED foods and activities.

As previously mentioned, Wilfley et al. (2017) utilized an FBT intervention program. Wilfley et al. (2017) explored the impact of high and low doses of their FBT program. High and low doses of FBT provided the same information, handouts, and materials over the same period of time. Both doses also included family sessions and separate parent and child group sessions that focused on building supportive family and peer environments for healthy weight-control behaviors. High doses of FBT consisted of 32 weekly sessions and also included additional opportunities to engage in and practice skills through more intervention contact. Low doses of FBT consisted of 16 sessions that were held every other week. In the control group, participants had 16 sessions that were held every other week. Additionally, they only participated in the family sessions. One hundred seventy-two parent-child dyads, with children being ages 7-11 years old with BMIs greater than or equal to the 85<sup>th</sup> percentile (overweight or obese) and at least one parent being overweight or obese (BMI greater than or equal to 25) were recruited. The results showed that the higher dose of FBT led to the greatest child percentage weight reduction and enhanced child weight outcomes. Wilfley et al. (2017) notes that at 12 months, more than 80% of children in the higher dose group achieved clinically significant levels of weight change.

Having more opportunities to practice and receive feedback on desired behaviors helped parents acquire those behaviors in their children.

Bringing children to FBT programs, as was done by Wilfley et al. (2017), may not always be an option. Parent-based treatment (PBT) programs without children are alternatives to FBT programs. Boutelle et al. (2017) found that PBT was just as effective as FBT. They compared the effects of PBT to FBT in the following categories: parent weight loss, child and parent dietary intake, child and parent PA, parenting style, and parent feeding behaviors. Boutelle and colleagues recruited 150 overweight and obese 8- to 12-year-old children and their parents. When given similar treatment, with the only difference being the presence or absence of a child, researchers found that there were no significant differences among the two groups. This study suggests that the presence of a child during the treatment program does not have a significant impact on parents' application of newly gained skills and knowledge on preventing childhood obesity in their children. PBT programs may be viable options for parents and guardians who are unable to bring their child(ren) for FBT programs due to various reasons.

In addition to family- and parent- based treatment programs, another intervention that could be considered for childhood obesity prevention is having a school-based prevention program. Kubik et al. (2021) evaluated the effects of a secondary obesity prevention intervention to reduce excess weight gain involving 132 parents and their children who were ages 8- to 12-years-old with a BMI greater than or equal to the 75<sup>th</sup> percentile. The intervention was delivered outside of usual school hours and over a course of nine months. It consisted of 90-minute kid group sessions once or twice a month, 90-minute parent group sessions every other month, and a 60-minute home visit for each parent/child dyad every quarter. A control group which only

received monthly newsletters was also included in the study. The sample population of this study consisted of people who were mostly diverse (49% White, 30% Hispanic, 28% Black, and 25% other race/ethnicity) and considered low-income. Researchers did not find significant differences between BMI z-scores, other anthropometric measures, physical activity, sedentary behavior, diet, or quality of life in the participants in the intervention (Kubik et al., 2021). This study demonstrated an ineffective school-based intervention program; however, when considering the results of Wilfley et al. (2017), it is possible that Kubik and colleagues did not allow for an ample dosage that will allow parents and children opportunities to practice desired behaviors.

### ***Interventions targeting dietary gatekeepers for healthy food intake***

Parental self-efficacy (PSE) is the confidence that a parent has in themselves to prepare healthy, nutritious meals for their family. Fulkerson et al. (2018) evaluated personal and behavioral outcomes of parents and children in the Healthy Home Offerings via the Mealtime Environment (HOME) Plus intervention program. The HOME Plus intervention used social cognitive theory and a socio-ecological framework to address personal, behavioral, and environmental factors associated with initiation, support, and reinforcement of healthful home environments, parent and child shopping, eating and screen time-related behaviors and self-efficacy in creating healthy family meals. After a nine-month follow-up, there were fewer behavioral changes than hypothesized. Parents in the intervention group, however, were able to improve self-efficacy in identifying appropriate serving sizes (Fulkerson et al., 2018). This study is not generalizable because of the lack of diversity in participants. Participants were also well educated and had high frequencies of eating meals together before the intervention. The question that this study raises is: “Did the participants need to change many habits before they participated in this study? Is this the reason why there were not as many behavior changes as

hypothesized? How would the study results be different if the participants were not well-educated and did not have high frequencies of eating meals together before the intervention?”

In a different study, Doring et al. (2016) provided motivational interviewing as an intervention to prevent childhood obesity over the course of 39 months in the PRIMROSE prevention trial of childhood obesity. A total of 1355 families with 1369 infants (9- to 10-months of age) were randomized into either the control group, which received usual care, or the intervention group, which received one group session and eight one-on-one sessions with a nurse trained in motivational interviewing for healthy food habits and physical activity. The outcomes for this study were children’s anthropometric measurements at 4-years of age, the mothers’ anthropometric data after the 39 months, and mothers’ and children’s food and physical activity habits. Doring et al. (2016) found that there were no significant differences in the outcomes between those in the control group and those in the intervention group.

Doring et al. (2021) conducted a follow-up assessment on the parental self-efficacy of 928 mothers who participated in Doring et al. (2016) with children who were 4-years old. They used the Parental Self-Efficacy for Promoting Healthy Physical Activity and Dietary Behaviors in Children scale (PSEPAD), which measured PSE for promoting healthy dietary behaviors in children, PSE for limit-setting of unhealthy dietary and physical activity behaviors in children, and PSE for promoting healthy physical activity behaviors in children. They found that the motivational interviewing had a significant effect in improving PSE for promoting healthy dietary behaviors in children ( $p = 0.007$ ); however, there were no significant differences in PSE for limit-setting of unhealthy dietary and physical activity behaviors in children and PSE for promoting healthy physical activity behaviors in children (Döring et al., 2021). The effectiveness

of using motivational interviewing and principles of cognitive-behavioral therapy to improve PSE was only significant for PSE for promoting healthy dietary behaviors in children.

Motivational interviewing and principles of cognitive-behavioral therapy did not prove to have significant effects on PSE for limiting unhealthy dietary and physical activity behaviors, nor did it have significant effects on PSE for promoting healthy physical activity behaviors. Although there were no significant differences for the control and intervention group for children's and mothers' anthropometric data and physical activity habits in Doring et al. (2016), Doring et al. (2021) suggests that motivational interviewing with principles of cognitive behavioral therapy can promote healthy dietary behaviors.

Numerous studies with interventions targeting dietary gatekeepers have incorporated different methods of intervention such as providing parents and dietary gatekeepers with access to tailored intervention videos (Amaro et al., 2017), access to online health information (Hammersley et al., 2019; Helle et al., 2019; Roed et al., 2021), and school-based interventions (Gomes et al., 2018). Culturally relevant interventions for minority and ethnic populations are important in helping reduce the prevalence of childhood obesity. Amaro et al. (2017) compared the effects of viewing one or two culturally tailored intervention videos on buying healthy, yet culturally relevant foods, and mindful shopping habits. This study used a convenience sample of 218 Latinas who identified as the family member primarily responsible for shopping for food. Participants were recruited from church and Head Start locations in east and south Los Angeles, California and were split into two cohorts. One cohort (n=113) watched only one intervention video, whereas the other cohort watched two intervention videos. Questionnaires were administered before, immediately after, and two months after the interventions to measure the effect and outcomes of watching either one or two intervention videos. The study found that

knowledge in both intervention groups was improved, however, the group that watched two intervention videos improved their shopping behavior more than the group that only watched one intervention video (Amaro et al., 2017). This study also supports the higher and lower dose results in Wilfley et al. (2017), as the intervention group with a higher dose of intervention had better outcomes.

Starting to shape children's dietary patterns as early as infancy could prove to be helpful in also reducing the prevalence of childhood obesity. Helle et al. (2019) conducted a study on eHealth intervention aiming to promote healthy food habits from infancy. The focus was on healthy growth rather than preventing obesity. This study followed parents and infants from 5.5 months to 12 months and provided the intervention group with eHealth information tailored to the age of their children. At 12 months, children in the intervention group ate more fruits and vegetables, were more likely to eat breakfast and dinner, and less likely to be on mobile devices during meal times compared to the control group (Helle et al., 2019). Although the anthropometric measures between control and intervention groups did not differ, the children in the intervention group were eating more fruits and vegetables, which could promote healthy eating patterns and beneficial meal time routines as they grow older.

In a similar study by Roed et al. (2021), researchers gave parents with 10-month old infants six months of access to an eHealth intervention. This eHealth intervention was in the form of a website with modules covering an introduction and seven topics on promoting healthy food and eating environments for children. The website also contained recipes, a discussion forum, and highlighted information about food and beverages. Modules had activities like quizzes and games. Participants also received weekly emails with links to a new lesson. Parents

were evaluated immediately after the intervention ended, then followed up when children were around 17 months and a second time when children were around 24 months. Roed and colleagues found that frequency of vegetable intake was higher in the intervention group and that frequency increased at the first follow-up. However, the frequency of vegetable intake decreased at the second follow-up. There were no significant differences between the intervention and control groups for fruit intake and intake of discretionary foods (Røed et al., 2021). Contrary to predictions of Helle et al. (2019), Røed et al. (2021) showed that long-term results for frequency of healthy foods in children also dwindled. With these results, researchers suggested that booster sessions were needed to reinforce healthy food intake.

In a different eHealth intervention, Hammersley et al. (2019) assessed the efficacy of a parent-focused, internet-based healthy lifestyle program on child BMI, obesity-related behaviors, parent modeling, and parent self-efficacy. They found that the web-based intervention improved dietary-related practices and self-efficacy but that it did not reduce BMI. In this study, a significant reduction in BMI may not have occurred because 91% of children in the sample were already at a healthy weight. Future interventions should consider excluding children who are below the 85<sup>th</sup> percentile when measuring child BMI.

In a parental school-based intervention, Gomes et al. (2018) studied the effectiveness of three different interventions in improving young children's eating patterns. One group involved a complete intervention (CIG) consisting of four sessions of nutrition education and parent and child support. Another group had minimal intervention (MIG), which entailed routine checkups and printed nutrition education material. Finally, a control group (CG) with no interventions was included. Complete intervention involving four sessions was more effective in increasing the

frequency of children's healthy food intake compared to minimal intervention and no intervention. However, in a follow-up assessment, these interventions seemed to be non-significant. The CIG had more positive improvements in children's healthy food intake compared to the MIG and CG but differences were not significant (Gomes et al., 2018). Despite effectiveness in improving frequency of healthy food intake, healthy food intake frequency began to dwindle and was not long-term. This study supports Roed et al. (2021) in that reinforcement sessions would be needed to strengthen healthy dietary behaviors. Additionally, the use of motivational interviewing in one-on-one sessions with parents could promote the maintenance of healthy dietary behaviors as suggested by Doring et al. (2021).

### ***Interventions specifically targeting children and not the dietary gatekeeper***

Dietary gatekeepers play important roles in the beginning of a child's life, especially starting in the home. As children grow up and are exposed to other influences, their dietary habits and preferences change. Some studies look at the effects of interventions in children, excluding their parents. In a recent study by Binder et al. (2020), researchers examine how different message framing impacts children's food intake. Children, ages six to ten, were shown one of three animated cartoons: a gain-framing message about healthy foods, a loss-framing message about healthy foods, and a message with nothing about healthy foods. Gain-framing messages talk about the benefits of consuming healthy foods, whereas loss-framing messages talk about the downfalls of not eating healthy food. After the children watched the video corresponding to their group, they were given healthy fruit options or unhealthy snack options. They were then asked what they just watched and if they remembered what was said in the videos. Children who had a greater awareness of the gain-framing message were more likely to choose the healthy fruit options, whereas children with greater awareness of the loss-framing

message were not influenced to choose healthy fruit options (Binder et al., 2020). This study demonstrated that providing gain-framing nutrition education in interventions is more beneficial in comparison to loss-framing messages. This information is useful to know as it can help program planners and dietary gatekeepers encourage children to eat healthier foods.

Llaurado et al. (2018) followed-up on a school-based intervention program specifically targeting children and not the dietary gatekeeper. In the original study, Tarro et al. (2014) provided an intervention program to 1,222 students, ages 7- to 8-years old, that consisted of 12 classroom activities, teaching aid booklets, and parental activities. In the control group, there were 717 students. This intervention program was implemented over the course of three years and significantly decreased the prevalence of obesity in boys in the intervention group compared to the boys in the control group ( $p = 0.01$ ). Tarro et al. (2014) also observed significant increases in healthy eating habits, such as eating breakfast ( $P = 0.01$ ), eating a second fruit per day ( $P = 0.03$ ), eating at least one vegetable a day ( $P = 0.04$ ), and vegetables more than once a day ( $P = 0.001$ ). However, similar to Gomes et al. (2018) and other studies, Llaurado et al. (2018) did not see long lasting results in healthy food intake. Llaurado et al. (2018) found that both intervention and control groups had decreases in consumption of healthy foods like dairy products, fruits, and fish four years after the end of the intervention program. Despite the decline in healthy food intake, researchers did see reduced BMI z-scores in their girl-intervention group compared to the girl-control group. The boys in the intervention group had reduced obesity prevalence and greater amounts of physical activity (PA) after school compared to the boys in the control group (Llauradó et al., 2018). Tarro et al. (2014) and Llaurado et al. (2018) show that a school-based intervention program targeting children can reduce the prevalence of obesity and decrease BMI. It also shows that the intervention program had long-lasting effects in encouraging PA

afterschool, but that healthy food habits need to be reinforced. These studies show that one-time intervention programs are beneficial in initiating healthy eating patterns; however, more nutrition intervention is needed to ensure long-lasting habits. In this next section, some of the studies reviewed above will be discussed in terms of consideration of methods for the proposed study.

### **Research Methodology**

Studies in this literature review have shown that initiating healthy eating habits is possible; however, much of the literature have shown that interventions may not have the desired long-lasting effects of reducing the anthropometric measurements of children at risk of obesity. Researchers suggest the need for interventions with longer program durations; however, a program that requires a lot of time commitment may see increased attrition rates. The proposed study will be somewhat similar to Tavares et al., (2017). Dietary gatekeepers will be the primary participants. Both the control group and the intervention group will participate in the same intervention program prior to the start of the study. Only the intervention group will receive nutrition education reinforcement sessions by a trained dietitian. Unlike Tavares et al., (2017), participants will not receive monthly resources or interactions with a dietitian. Participants in this proposed study will only receive resources and reinforcement sessions once a year in order to imitate well-child visits, which requires less time commitment annually from parents. Having an intervention with less time commitment annually may help reduce the attrition rate of participants.

Spies et al., (2022) followed mothers and children for several years after mothers completed their interventions; however, the results of lasting effects of the intervention program are not promising based on current findings. Additionally, Spies and colleagues plan to only

follow up with participants until the children are five years of age. The Centers for Disease Control (2021) states that the highest prevalence of obesity in children are among children ages 6 to 19 years old; therefore, this study will set up parameters for the inclusion of only children ages 5-6 years old. Spies et al., (2022) also did not collect socioeconomic status information and anthropometric measurements at follow-ups. Although the proposed study will include only mothers who are/were WIC eligible, thus indicating that their annual income is at or below a specified income, their socioeconomic status will still be recorded, as this information may be associated with child development.

Roed et al. (2021) and Hammersley et al. (2019) utilized eHealth interventions for parents to access their interventions on their own time. Taking into consideration that mothers may have busy schedules, this proposed study will utilize virtual reinforcement sessions to help make scheduling reinforcement sessions easier based on a mother's availability. Additionally, having virtual reinforcement sessions instead of reinforcement material will allow for mothers to ask questions and receive answers

In contrast to Hammersley et al. (2019), but similar to Wilfley et al. (2017), this proposed study will have exclusion parameters around child participant weights and only include children whose BMI-for-age are in the 85th percentile or greater. Hammersley and colleagues (2019) did not see significant changes in BMI z-scores possibly because most of their participants' children were already at a healthy weight; therefore, exclusion of children with BMIs-for-age under the 85<sup>th</sup> percentile may help to observe effects of the proposed intervention on children's BMI-for-age.

Although having a family-based treatment program would be ideal for involving both the parents and the children, having both parent and child present for the intervention program may be difficult. Boutelle et al. (2017) suggests that an intervention that is parent-based would be just as effective as an intervention that is family-based. Therefore, in this proposed study, the presence of the child during the intervention is not required. The proposed study will also incorporate motivational interviewing (Doring et al., 2016) during intervention sessions led by dietitian nutrition professionals to motivate participants to make healthier diet choices for their families.

### **Summary**

Dietary gatekeepers have a significant impact on dietary behaviors of their children and in reducing the prevalence of childhood obesity. As the literature review displayed, mothers have a greater influence over food preference of a child when compared to an out of home influence like the child's best friend (van den Broek et al., 2020). Barriers affecting a dietary gatekeeper's ability to provide healthy meals include many factors such as the cognitions, food-related capabilities and practices of the dietary gatekeeper, their satisfaction with how healthy their family diet is, parental stress, and parental depression. These factors can be addressed in interventions that have a secondary effect of improving children's BMIs and health outcomes. When interventions address and educate parents on their roles and abilities in the home environment, they have the ability to create healthier environments for their children.

Interventions that provide resources for coping with chronic stress and lessons to improve PSE are associated with improving child dietary patterns (Döring et al., 2021; Fulkerson et al., 2018). Providing parents with access to culturally tailored intervention videos and access to

online health information have also increased PSE. Additionally, Amaro et al. (2017) and Wilfley et al. (2017) suggest increasing the doses of the interventions to produce more effective outcomes.

In some scenarios, like when a parent is busy, requiring parents to be present for multiple sessions of an intervention program may not be feasible. Interventions utilizing eHealth programs could be a reliable method to improve PSE in parents as they would be able to utilize the resource on their own time. Results from the study conducted by Helle et al. (2019) did not show differences in the anthropometric measures between the control and intervention groups; however, they did note that children in the intervention group consumed more fruits and vegetables. Roed et al. (2021) also saw similar results after parents were given access to an eHealth program for 6 months, however, after a second follow-up, there was a decline in fruit and vegetable consumption by the intervention group. Hammersley et al. (2019) was a third study that also supported the effectiveness of eHealth interventions in improving dietary-related practices and parental self-efficacy.

Gomes et al. (2018) and Llauro et al. (2018) both found that interventions did not have lasting effects a year after the intervention program had been completed, but Binder et al. (2020) found that using gain-framing messaging in child nutrition education had a greater influence in children's choices to consume more fruits and vegetables. It is evident that there is a need for reinforcement intervention sessions because of the recurring theme of declining fruit and vegetable consumption in children. Given that there is currently no evidence of how nutrition education reinforcement and relearning opportunities affect childhood obesity and children's meal time habits, this proposed study aims to determine the effect of annual nutrition education

reinforcement sessions on children's 'BMI-for-age z-scores and average weekly consumption of fruits and vegetables outside of school meals compared to children whose parents do not receive annual nutrition education reinforcement sessions.

### Chapter 3: Methodology

Studies have shown that dietary gatekeepers are the primary influence over a child's eating behavior (Bouhlal et al., 2015; Jastreboff et al., 2018; van den Broek et al., 2020). Their behaviors affect their weight, BMI, and the risk of childhood obesity, which can lead to chronic health conditions in the child's life if left unaddressed (Centers for Disease Control and Prevention, 2021). To address childhood obesity, past studies were created with intervention programs that educated dietary gatekeepers on providing healthy foods and creating healthy habits for their children (Amaro et al., 2017; Fulkerson et al., 2018; Helle et al., 2019; Røed et al., 2021; Wilfley et al., 2017). Researchers found that their intervention programs led to dietary gatekeepers providing healthier foods for their children and that, as a result of the program, children ate more fruits and vegetables. According to a study by Wilfley et al. (2017), spending more time educating dietary gatekeepers led to a greater weight reduction percentage in children compared to other interventions that did not spend as much time educating dietary gatekeepers. In other studies where researchers followed up on participants post-intervention, researchers observed a decrease of frequency in the weekly consumption of fruits and vegetables from all participants (Gomes et al., 2018; Røed et al., 2021). Gomes et al. (2018) found that the complete intervention group (CIG), or group that received more comprehensive education and longer intervention duration improved children's healthy food intake after the intervention. Upon follow-up assessments, researchers found that the healthy food intake became non-significant. Similarly, Roed et al. (2021) initially observed significant increases in vegetable intake in the intervention group; however, after the second follow-up, fruit and vegetable intake in the intervention group also decreased. All of these studies suggested the need for a longer duration of the intervention and reminders to obtain long-term effects.

Based on the current literature, this proposed study will examine the effects of an annual nutrition intervention program that follows dietary gatekeepers and their children ages 4-5 years after their discontinuation of the WIC program. This chapter will cover the methodology of the proposed study. I will discuss the research design, data collection process, data analysis plan, threats to validity, and ethical procedures.

### **Research Protocol**

#### ***Research Question 1***

Will annual nutrition education reinforcement sessions for dietary gatekeepers result in lower child BMI-for-age z-scores compared to participants not receiving annual nutrition education reinforcement sessions?

#### ***Hypotheses***

H<sub>01</sub>: Annual nutrition education reinforcement sessions for dietary gatekeepers will have no effect on child BMI-for-age z-scores.

H<sub>a1</sub>: Children whose parents/dietary gatekeepers receive annual nutrition education reinforcement sessions will have lower BMI-for-age z-scores compared to children whose parents/dietary gatekeepers do not receive annual nutrition education reinforcement sessions upon follow-up assessments.

#### ***Research Question 2***

Will annual nutrition education reinforcement sessions increase the number of servings of fruits and vegetables consumed weekly by children from baseline scores in children whose parents/dietary gatekeepers receive annual nutrition education reinforcement sessions compared

to children whose parents/dietary gatekeepers do not receive the annual nutrition education reinforcement sessions?

### *Hypotheses*

H<sub>02</sub>: Annual nutrition education reinforcement sessions will have no effect on the number of servings of fruits and vegetables consumed weekly (post-intervention) by children whose parents/dietary gatekeepers receive annual nutrition education reinforcement sessions compared to children whose parents/dietary gatekeepers do not receive annual nutrition education reinforcement sessions.

H<sub>a2</sub>: Annual nutrition education reinforcement sessions will increase the number of servings of fruits and vegetables consumed weekly (post-intervention) by children whose parents/dietary gatekeepers receive annual nutrition education reinforcement sessions compared to children whose parents/dietary gatekeepers do not receive annual nutrition education reinforcement sessions.

### *Table 1*

#### *Research Questions and Variables*

Research Question	Independent	Dependent	Confounding
Will annual nutrition education reinforcement sessions for dietary gatekeepers result in lower child BMI-for-age z-scores compared to participants not receiving annual	Annual nutrition reinforcement education sessions for dietary gatekeepers	Child BMI-for-age z-scores	Socioeconomic status Food insecurity interventions

nutrition education reinforcement sessions?			
Will annual nutrition education reinforcement sessions increase the number of servings of fruits and vegetables consumed weekly by children from baseline scores in children whose parents/dietary gatekeepers receive annual nutrition education reinforcement sessions compared to children whose parents/dietary gatekeepers do not receive the annual nutrition education reinforcement sessions?	Annual nutrition reinforcement education sessions for dietary gatekeepers	Number of servings of fruits and vegetables consumed per week	Food insecurity Age of dietary gatekeepers Environmental factors (food deserts, population density, exposure to air pollution)

### Study Design

This study will be a four year, randomized controlled trial to determine the effects of an annual nutrition reinforcement education program on child BMI-for-age z-scores and weekly servings of fruits and vegetables consumed by children. A randomized controlled trial is appropriate to assess the outcomes of annual nutrition reinforcement sessions because it will be able to determine if there is an association between reinforced nutrition education sessions and

improved child BMI-for-age z-scores, and F&V consumption in children. Participants will be randomized into either the control group or the intervention group. Both groups will participate in a one-time 4-week nutrition program, *MyPlate for My Family* (see Appendix A). Additionally, they will have a handout from one of the discussion topics from the *MyPlate for My Family* program (see Appendix B for a complete set of handouts) sent to their emails every quarter to remind them about tips for applying what they've learned and recipes they can try. The intervention group will receive annual nutrition education reinforcement sessions, whereas the control group will not receive annual nutrition education reinforcement sessions. *MyPlate for My Family* is a pre-existing program created by the U.S. Department of Agriculture.

### ***Setting and Sample Size***

#### ***Sample Size***

This study will take place in Milwaukee County, Wisconsin. A total of five dietitians will be recruited and specifically trained for the nutrition education reinforcement sessions. Dietitians will be paid \$1000 per year during the duration of the study for their services by the Advocate Aurora Health Research Institute. Each of the five dietitians will be assigned to 20 participants who are part of the intervention group. There will be 100 participants in the control group who will not receive the reinforcement sessions. The proposed study will follow a total of 200 mother-child dyads over a period of three years (100 participants in the intervention group and 100 participants in the control group). This sample size is a convenience sample in line with the number of participants in similar studies (Ek et al., 2021; Fulkerson et al., 2018; Jastreboff et al., 2018; Wilfley et al., 2017). Participants referred from the Milwaukee County WIC clinics will be randomly assigned into the intervention group or the control group. Participants and dietitians

will be made aware if a participant is in the annual nutrition education reinforcement group before attending the first week of the *MyPlate for My Family* program.

### *Population*

Inclusion criteria: The study subjects will be mother and child dyads who are/were part of the WIC program. Children in the mother-child dyad with a BMI-for-age in the 85<sup>th</sup> percentile or greater and are between the ages 4-5 years old will be included in this study. They will be recruited directly from the WIC clinic that they frequent. WIC-eligibility is based on four requirements: categorical, residential, income, and nutrition risk. In the categorical requirement, individuals are considered eligible if they are a woman who is pregnant, postpartum (up to six months after the birth of the infant), or breastfeeding up to the infant's first birthday, and if they are an infant or child under 5 years old. The second requirement is that the participant lives in the state that they apply. The third requirement is that applicants must have income at or below an income level of 185% of the annual poverty level. The fourth requirement to participate in WIC is that applicants must be identified as a nutritional risk or having medical-based or dietary based conditions. They must be seen by a health professional to determine if they have a nutritional risk.

Exclusion criteria: Mother and child dyads will be excluded if the child has a BMI-for-age under the 85<sup>th</sup> percentile or a preexisting health diagnosis that requires them to be on a specific diet. Additionally, children who are not living with their birth mothers will be excluded. Reasons for removal from the study include if the participant switches providers to a healthcare professional who is not participating in the study, if the participant or child is no longer able to participate due to new health conditions such as diagnosis of cancer, other diseases, or sudden onset of life-threatening conditions, and if the participant chooses to no longer participate.

*Recruitment*

Counselor Recruitment: Similar to Rauh et al. (2014), dietitians in Milwaukee County will be contacted by email with recruitment flyers (see Appendix C) and by phone in January of 2024. Dietitians will be required to attend a seminar to be trained to implement counseling and nutrition education reinforcement sessions for the study participants prior to the start of the *MyPlate for My Family* program. The seminar will be designed and taught by the lead researcher based on the *MyPlate for My Family* curriculum (see Appendix A). The seminar will last one hour long and have multiple seminar dates within a two-month timespan for flexibility around a provider's schedule. Dietitians will also be provided a counselling guidance sheet that uses the principles of motivational interviewing to guide patients towards behavior change.

Participant Recruitment: Participants will be mothers with children ages 4-5 years old who are overweight or obese (BMI-for-age equal to or greater than the 85<sup>th</sup> percentile). They will be invited to join the study by their WIC nutritionist at Milwaukee County WIC clinics starting in April of 2024. This recruitment process will be open enrollment and will end when there is an adequate number of participants recruited. All participants who complete the *MyPlate for My Family* program, meaning they attended all four discussion sessions, will receive a Hunger Task Force colander and 2-in-1 vegetable peeler and brush at the end of the last discussion, paid for with funding from the US Department of Agriculture SNAP-Education grant.

Mothers must submit a signed informed consent (see Appendix D) in order to participate. Assent forms will be available (see Appendix E) should mothers wish to have their children sign it once the children are 7 years old. Participants will be free to withdraw from the study at any time for any reason.

***Randomization***

Participants will be randomly selected to be in the control group or the intervention group. Their pre-surveys will have a number from one to 300 on the back of the survey. A research assistant will use Research Randomizer (Urbaniak and Plous, 2015) to generate two sets of numbers. Each set will have 150 numbers with numbers ranging from one to 300. Each number in the set will be unique and will appear in the other set. The number on the back of a participant's pre-survey will determine which group they are in based on which set their number was randomized into. The first set of randomized numbers will be in the control group. The second set of randomized numbers will be in the intervention group. In the intervention group, every 20 consecutive participants in the order that their number is listed in the randomized set will be assigned to a specific dietitian. Because this study is not blinded, participants will be told if they are meeting with a dietitian and who their assigned dietitian is. Dietitians will also be informed who their patients are.

**Data Collection Process*****Intervention***

Beginning of study:

Participants will all take a baseline survey (Appendix F), then complete the *MyPlate for My Family* program at the Hunger Task Force Community Engagement Center. This will be a four-week program taught by the Hunger Task Force's Nutrition Educator. The program will consist of weekly discussion sessions with participant take-home handouts (see Appendix B). Each session will last about 45 minutes. Take-home handouts will also be sent to parents through MyChart every three months to remind parents about what they learned from the program.

The second data collection will be immediately after the completion of the *MyPlate for My Family* program. After the completion of the *MyPlate for My Family* program, the nutrition educator at the Hunger Task Force will collect data on children's the weekly average of fruits and vegetables consumed outside of school meals. The following three data collections will be completed by mothers' assigned dietitians if they are in the intervention group or by a paid research assistant if mothers are part of the control group. Dietitians and research assistants will be alerted through Aurora's electronic health record platform that a child has completed their well-child visit and that the dietitian or research assistant should reach out to the mothers.

#### Annual Nutrition Education Reinforcement Sessions:

The dietitian will maintain contact with their participants using MyChart and will reach out to participants to schedule virtual meeting times to provide annual nutrition education reinforcement sessions. Mothers in the intervention group will schedule a one-hour virtual meeting session with their assigned dietitian. During these sessions, their dietitian will discuss with them previously taught concepts from the *MyPlate for My Family* program and will use motivational interviewing to help mothers set goals to apply the concepts from *MyPlate for My Family*. Dietitians will follow a counseling guidance tool (see Appendix G) to ensure that they are using motivational interviewing techniques and staying consistent with their methods across all their patients. This tool will also remind dietitians to ask mothers about the average number of servings of fruits and vegetables that their child eats on a weekly basis outside of school meals. After the dietitian and a mother from the intervention group meet, the dietitian will collect the child's anthropometric data and log all necessary information into the data collection form.

For children in the control group, their age, weight, and height will be obtained annually from their electronic health records by a paid research assistant working on the study. The research assistant will have access to the electronic health records of children in the control group and will also be notified when children have completed their annual well-child visit. The research assistant will call mothers in the control group to ask them about their child's average serving of fruits and vegetables consumed on a weekly basis outside of school meals. Dietitians and the research assistant will complete a data collection form (see appendix H) every year and submit this form no later than January of the next year for calculation of BMI-for-age z-scores and analysis. The data collection form will be used to collect parents' names, their child's age in months, their child's weight in kilograms, their child's height, and the average number of servings of fruits and vegetables that their child eats on a weekly basis outside of school meals. Before submitting the forms, parents' names must be removed from the document by the dietitians and research assistant to ensure confidentiality.

### ***Instrumentation***

Contact information will be collected in consent forms. Mothers will be contacted by phone or email via MyChart to be reminded of their child's annual well-child check-up and of their annual nutrition education reinforcement sessions if they are in the intervention group. They will also receive reminders to schedule their check-up appointment with their health care provider. There will be one questionnaire- an initial baseline questionnaire for demographic data, mothers' highest education level, children's genders, and average number of servings of fruits and vegetables that children consume on a weekly basis outside of school meals (see Appendix F). Children's age, weight, and height will be obtained annually from their electronic health records by their assigned dietitian if they are in the intervention group. At children's annual well-

child visit, their height and weight will be measured by a trained nurse or medical assistant using a Rice Lake RL-MPS-50 Mechanical Physician Scale with Height Rod, Model #: T9FB2381071 (see appendix I).

Data on a child's age in months, height, weight, and average number of servings of fruits and vegetables consumed weekly by the child (outside of school meals) will be collected:

- In the initial baseline survey before the *MyPlate for My Family* program.
- After the last discussion for the *MyPlate for My Family* program. *Note:* Children's anthropometric data will not be collected during this data collection, as four weeks may not be enough time to see a change in BMI-for-age z-score.
- Year 1: After the annual well-child check-up to assess the child's age in months, height, weight, and average number of servings of fruits and vegetables consumed weekly by children (outside of school meals).
- Year 2: After the annual well-child check-up to assess the same parameters as in year 1.
- Year 3: After the annual well-child check-up to assess the same parameters as year 1.

### **Data Analysis Plan**

#### ***Descriptive Statistics***

Descriptive statistics will include mean and standard deviation. Mean will be used to calculate the baseline characteristics of the population, as well as the BMI-for-age z-scores and average number of servings of fruits and vegetables consumed by children outside of school meals. Standard deviations will be used for the average BMI-for-age z-scores and average number of servings of fruits and vegetables consumed by children outside of school meals.

*Inferential Statistics*

The SAS Program for CDC Growth Charts (Centers for Disease Control and Prevention, January 2023) will be used to calculate children's BMI-for-age z-scores using their gender, age in months, height, and weight. The independent t-test will be used to provide inferential statistics to compare the mean BMI-for-age z-scores of children among the control group and the intervention group. The independent t-test will also be used to compare the effect of annual nutrition education reinforcement sessions on children's consumption of fruits and vegetables outside of school meals and the effect of no annual nutrition education reinforcement sessions on children's consumption of fruits and vegetables outside of school meals.

Z-score is an inferential statistic used to calculate children's BMI-for-age.

Chi-square will be used to compare if there are any significant differences between the control group and the intervention group in terms of age, gender of child, race, and education level.

Chi square tests will compare categorical demographic variables based on control or intervention.

*Table 2*

*Selection of Appropriate Statistical Test*

Research Question	Independent Variable	Potential Response	Level of Measurement	Dependent Variable	Potential Response	Level of Measurement	Test of Significance
One	Annual nutrition education	Yes or No	Nominal	Average BMI-	-3 to 3	Interval	Independent t-test

	reinforcement sessions			for-age z-score			
Two	Annual nutrition education reinforcement sessions	Yes or No	Nominal	Average weekly number of servings of fruits and vegetables consumed outside of school meals by children	0 to 30	Ratio	Independent t-test

### Threats to Validity

Attrition rate is a threat to internal validity as we cannot predict how many participants will drop out of the study. The Hawthorne effect is another threat to internal validity and can also be a threat to external validity. Since participants will know that they are part of the study, they may report higher average servings of fruits and vegetables children consume on average in a week. A threat to external validity is history. History may be a threat to validity in the event of a pandemic outburst that will require changes in the study methodology. If there is a lock down, participants may not be able to meet for the *MyPlate for My Family* program.

### Ethical Procedures

Data from this study will be kept private through password encrypted computer-based files and only accessible to study personnel. Paper documents, such as informed consent forms and pre-surveys, will be stored in a locked filing cabinet at the Hunger Task Force. Data collection forms will be filled out by dietitians after they meet with their patients. These forms will be password encrypted documents, meant to be filled on a computer and by a dietitian who

has the password to the document. Every year after a dietitian has met with their 20 assigned patients, they will delete the names of their participants from the data collection form and then will send their password encrypted document to the lead researcher via an encrypted email. Completed data collection forms will be stored as password encrypted documents on a private flash drive and locked in a filing cabinet with the informed consent forms, assent forms, and pre-surveys at the Hunger Task Force. An Institutional Review Board (IRB) application will be submitted (see Appendix J).

### Summary

The proposed three-year, randomized, controlled study will examine the effectiveness of annual nutrition education reinforcement sessions for dietary gatekeepers. This study will compare the BMI-for-age z-scores and average servings of fruits and vegetables consumed on a weekly basis outside of school meals of children in this study. Two groups will be examined in this study. The first group, which is the control group, will participate in the *MyPlate for My Family* program and receive quarterly handouts, but they will not receive annual nutrition education reinforcement sessions. The second group, which is the intervention group, will participate in the *MyPlate for My Family* program and receive quarterly handouts, along with annual nutrition education reinforcement sessions. The participants will be recruited from local WIC clinics around Milwaukee County. Data on the participants will be collected before the *MyPlate for My Family* program, after the *MyPlate for My Family* program, then one, two, and three years later after their children's annual well-child visit. Data will be analyzed using the Chi-square test and independent t-tests. Informed consent and assent forms will be required from participants and an Institutional Review Board (IRB) application will be submitted. This next

chapter will include anticipated results. Any descriptive and/or inferential statistic data will be included there.

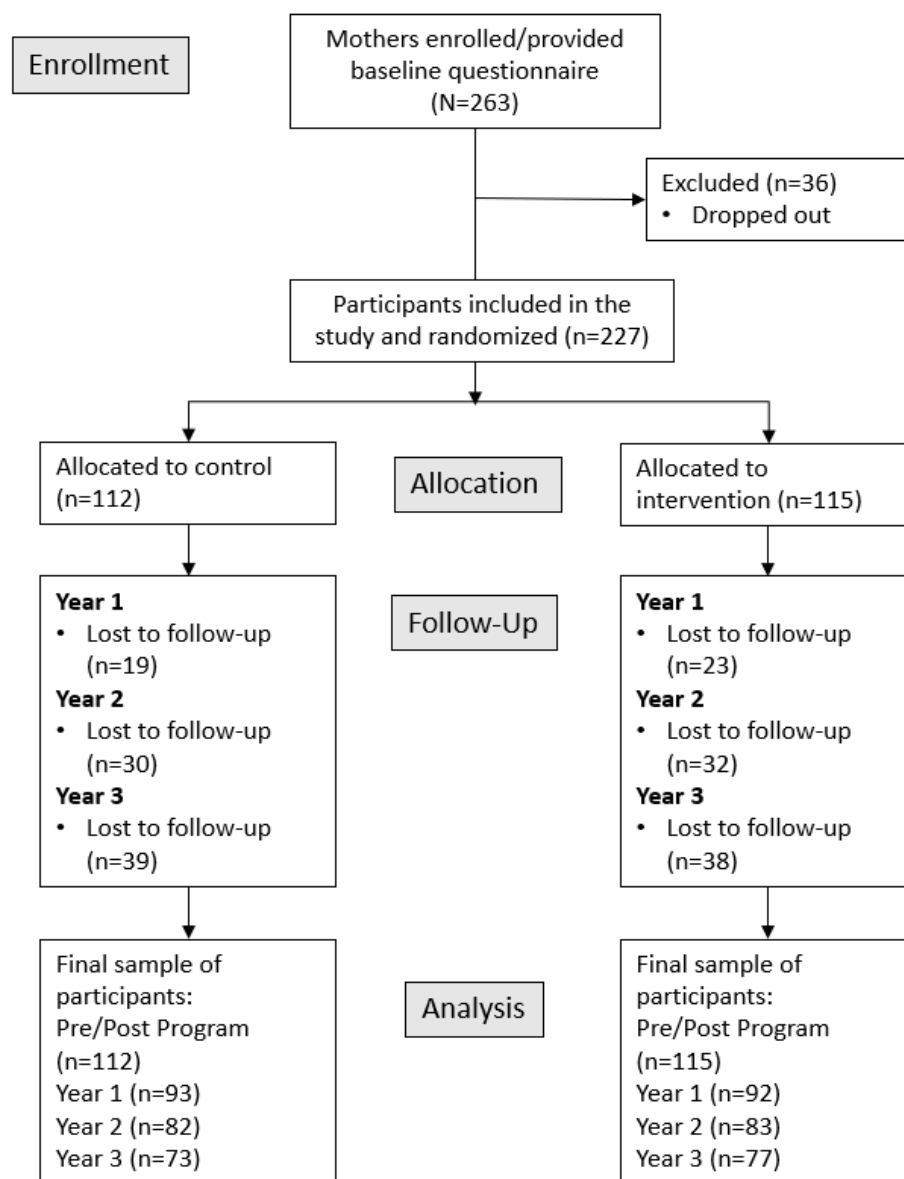
## **Chapter 4: Anticipated Results**

### **Characteristics of the Study Sample**

Figure 1 shows the anticipated flow of participants in the study. During the enrollment period, I anticipate that 263 mothers are expected to sign up to participate in the study and that they will all complete the baseline questionnaire (pre-survey); however, it is expected that 36 (13.7%) participants will drop out before participants are randomized. A total of 227 mothers are expected to be included in the study. One hundred and twelve mothers of the 227 (49.3%) will be randomized into the control group and 115 mothers of the 227 (50.7%) will be randomized into the intervention group. During follow-up in year one, it is expected that 19 mothers in the control group and 23 mothers in the intervention group will be lost to follow-up. During follow-up in year two, it is expected that an additional 11 mothers in the control group and nine mothers in the intervention group will be lost to follow-up. In year three, it is expected that an additional nine mothers in the control group and six mothers in the intervention group will be lost to follow-up.

Figure 1

*CONSORT (Consolidated Standards of Reporting Trials) diagram for the Nutrition Education Reinforcement randomized controlled trial study.*



Demographic characteristics of the study population that are expected to be collected in the baseline questionnaire (pre-survey) can be found in Table 3. The study population will be split into four categories: age of mothers, genders of children in each group, race-ethnicity, and highest education level obtained by the mother. Participants in the control and intervention

groups are anticipated to not differ significantly in age of mothers, gender of children, race-ethnicity, or education level,  $\chi^2(3, N = 227) = 0.5, p > .05$ ,  $\chi^2(1, N = 227) = 0.9, p > .05$ ,  $\chi^2(5, N = 227) = 0.997, p > .05$ , and  $\chi^2(3, N = 227) = 0.992, p > .05$ , respectively.

Table 3

*Characteristics of the Study Population*

Variable	Control Group (n = 112)	Intervention Group (n = 115)	P-value
Age of Mothers (years), No. (%)			.918
18-25	44 (39)	45 (39)	
26-31	38 (34)	39 (34)	
32-40	27 (24)	26 (23)	
41+	3 (3)	5 (4)	
Genders in Each Group, No. (%)			.899
Boy	72 (64)	73 (63)	
Girl	40 (36)	42 (37)	
Race-Ethnicity, No. (%)			.998
Non-Hispanic White	36 (32)	35 (30)	
Non-Hispanic Black	31 (28)	34 (30)	
Hispanic	20 (18)	21 (18)	
Asian	11 (10)	11 (10)	
American Indian	9 (8)	8 (7)	
Other	5 (4)	6 (5)	
Education Level, No. (%)			.993
Less than high school	15 (13)	15 (13)	
High school	51 (46)	54 (47)	
Some college	28 (25)	27 (23)	
College education	18 (16)	19 (17)	

*Note.* N = 227. All participants were previously WIC participants, therefore all participants had incomes at or below 185% of Milwaukee's annual poverty level.

\*Significant differences between the control and intervention sample characteristics presented at the level  $\alpha \leq .05$  as indicated by  $\chi^2$  test.

### Child Anthropometrics

Children's birth date, gender, and anthropometric measurements (weight and height) will be obtained from their mothers in the baseline questionnaire and, with their mother's permission, from their electronic health records during years one, two, and three of the study. The BMI-for-age z-scores of children will be calculated using the SAS Program for CDC Growth Charts (Centers for Disease Control and Prevention, January 2023) with their age in months, gender, weight (kg), and height (cm). Table 4 shows the comparison of the anticipated mean BMI-for-age z-scores of children in each group and *P*-value comparing the control and intervention group at each data collection point. During year two, there is expected to be a significantly lower average BMI-for-age z-score in the intervention group compared to the control group (1.16,  $\pm 0.14$  and 1.30,  $\pm 0.11$ , respectively;  $p = .050$ ). Additionally, there is expected to be a significantly lower average BMI-for-age z-score in the intervention group compared to the control group in year three (1.07,  $\pm 0.18$  and 1.28,  $\pm 0.12$ , respectively;  $p = .025$ ).

*Table 4*

*Mean BMI-for-age z-scores of Children*

	Control <i>M</i> , ( <i>SD</i> )	Intervention <i>M</i> , ( <i>SD</i> )	<i>P</i> -value
Pre-Program	1.61, (0.11)	1.63, (0.13)	.695
Year 1	1.39, (0.11)	1.42, (0.14)	.636
Year 2	1.30, (0.11)	1.16, (0.14)	.050*
Year 3	1.28, (0.12)	1.07, (0.18)	.025*

\*Significant differences between the average BMI-for-age z-scores between the control and intervention groups presented at the level  $\alpha \leq .05$  as indicated by t tests.

### Weekly Servings of Fruits and Vegetables Consumed by Children Outside of School Meals

Mothers will be asked in the baseline questionnaire (pre-survey), after the completion of the *MyPlate for My Family* program, and after their annual well-child visits for three consecutive years of how many servings of fruits and vegetables their children ate on average in a week outside of school meals. Table 5 shows the anticipated average number of servings of fruits and vegetables that children in the control group and the intervention group will have eaten pre-program, post-program, after year one, after year two, and after year three. Additionally, the table shows the comparative data for the control and intervention groups (standard deviations and *P*-values) at each data collection point. In year three, children in the intervention group are expected to consume a significantly greater number of servings of fruits and vegetables outside of school meals per week compared to children in the control group (14.0,  $\pm 1.8$  and 11.3,  $\pm 2.2$ , respectively;  $p = .042$ ).

*Table 5*

*Mean Number of Servings of Fruits and Vegetables per Week Eaten by Children Outside of School Meals*

	Control <i>M</i> , ( <i>SD</i> )	Intervention <i>M</i> , ( <i>SD</i> )	<i>P</i> -value
Pre-Program	4.6, (2.3)	4.9, (2.2)	.772
Post-Program	8.6, (2.3)	8.9, (2.2)	.772
Year 1	9.0, (2.2)	9.5, (2.0)	.647
Year 2	10.4, (2.0)	12.0, (1.6)	.132
Year 3	11.3, (2.2)	14.0, (1.8)	.042*

\*Significant differences between the mean number of servings of fruits and vegetables anticipated to be eaten by children in the control and intervention groups presented at the level  $\alpha \leq .05$  as indicated by *t* tests.

### **Summary**

Characteristics of the study sample are anticipated to have no significant differences. Additionally, we anticipate that children in both the control and intervention groups will have no significant differences until year two and three. We also anticipate that there will be no significant differences in the average weekly consumption of F&V in children outside of school meals until the third year. The following chapter will further discuss the anticipated results of this study.

## **Chapter 5: Discussion**

Children who are obese have a greater risk of being obese as adults (Josey et al., 2019). Reducing the prevalence of childhood obesity will reduce the prevalence of future adult obesity. Mothers are often the primary dietary gatekeeper for their children; thus, they influence the way that their children eat. Van den Broeck, et al. (2020) have shown that children are more likely to be influenced by their mothers when choosing food outside of the home than they are to be influenced by their friends (van den Broek et al., 2020). Additionally, Bouhlal et al. (2015) showed that mothers are more likely to give healthier foods to girls and less healthy foods to boys. Interventions that encourage mothers and children to utilize healthy eating habits and reduce the prevalence of obesity have been shown to be effective post-intervention; however, researchers also saw no significant differences upon follow-up and even saw a decreased trend in consumption of healthy foods (Gomes et al., 2018; Llauredó et al., 2018). There is a lack of evidence on programs that demonstrate how relearning opportunities can reduce the risk of childhood obesity and encourage children's consumption of fruits and vegetables outside of school meal programs. This chapter will discuss the anticipated results of the proposed study and compare previous studies to the anticipated results. The strengths and limitations of this proposed study will also be discussed, along with suggestions for future studies.

### **Interpretation of Results**

This proposed study will evaluate the effects of annual nutrition education reinforcement sessions on children's BMI-for-age z-scores as well as their consumption of fruits and vegetables outside of school meal programs. It is predicted that all null hypotheses will be rejected and that all alternative hypotheses will be accepted. The predicted outcomes of the annual nutrition education reinforcement sessions will be that there will be significantly lower BMI-for-age z-

scores in the intervention group compared to the control group and that among the children in the intervention group, there will be a significant increase in the weekly number of servings of fruits and vegetables eaten by children outside of school meal programs.

### **Characterization of the Study Population**

Based on the characteristics of the study population, both the control and intervention groups were of similar sizes and had similar characteristics. There were no significant differences noted. As previously mentioned, Bouhlal et al. (2015) showed that mothers are more restrictive on what types of foods their children eat based on their gender. Because of this study, we compared the genders of children in the control group and in the intervention group to account for gender bias. In our study, there were more boys compared to girls involved in the study, however, both the intervention group and the control group had a similar proportion of boys to girls. There were no significant differences in the number of boys and girls in the control group compared to the intervention group ( $p = .899$ ).

### **BMI-for-age Z-Score Outcomes**

At baseline, before the MyPlate for My Family program, it is expected that there will be no significant differences found in the average BMI-for-age z-score of children in the control group and children in the intervention group. The *MyPlate for My Family* program is a four-week program, so any significant changes in BMI-for-age may not be detectable within a four-week time span; thus, data on children's anthropometric measurements will not be collected immediately after the completion of the *MyPlate for My Family* program. One year after the *MyPlate for My Family* program, it is expected that there be a decrease in BMI-for-age z-scores for children in both the control and intervention groups; however, there will be no significant

differences between the control group and intervention group, as both groups will have had sufficient time to apply what they learned from the MyPlate for My Family program. However, following the well-child visit in year one, participants in the intervention group are expected to meet with their dietitians who will help reinforce nutrition education that the mothers need support in. During the second annual check-in, the BMI-for-age z-score of children in the intervention group will be significantly lower than that of the control group. It is expected that this will most likely be associated with the additional support and guidance received by the dietitians in the previous reinforcement session. Similar to the previous year, mothers in the intervention group will meet with dietitians who reinforce nutrition education and provide guidance and support for the mother. During the third year, children in the intervention group will continue to have significantly lower BMI-for-age z-scores.

### **Weekly Servings of Fruits and Vegetables Served to Children Outside of School Meals**

At baseline, before the *MyPlate for My Family* program and immediately after, it is anticipated that there will be no significant differences found in the average number of servings of fruits and vegetables eaten by children outside of school meals per week. However, although there is no significant difference, children in the control and intervention group will consume more servings of fruits and vegetables immediately after the MyPlate for My Family program. One year after the program, it is anticipated that there will be a slight increase in the average number of servings of fruits and vegetables consumed per week (outside of school meals) by children in both the control and intervention groups; however, differences are not expected to be significant. The following year, after mothers in the intervention group have received a nutrition education reinforcement session, it is expected that there will be a greater increase in the average weekly servings of fruits and vegetables consumed by children in the intervention group. This

increase is not anticipated to be a significant difference. In the third year, children in the intervention group are expected to have a significantly greater consumption of fruits and vegetables (outside of school meals) compared to children in the control group.

### **Comparison to Other Studies**

The anticipated results section of this study provides data similar to Taveras et al. (2017), as the control group and intervention group in this study do not have significant differences within the first to second year following the MyPlate for My Family program; however, in our study, we anticipate improvements in both group's BMI-for-age z-scores and weekly average servings of fruits and vegetables consumed outside of school meals.

Additionally, we expect this study to have a similar conclusion to that found in van den Broek et al. (2020) since when mothers expose their children to more fruits and vegetables, it increases consumption of fruits and vegetables by the children. The results of this study are expected to show that children are consuming more fruits and vegetables following the interventions that their mother receives.

The anticipated results of this proposed study also match the results of Wilfley et al. (2017) and Gomes et al. (2018). After the 2 years of receiving reinforcement nutrition education sessions, it is anticipated that we will see a significant difference in BMI-for-age z-scores and average number of servings of F&V consumed weekly outside of school meals in the intervention group as compared to the control group. Wilfley et al. (2017) saw that the higher dose of family behavior therapy led to the greatest child percentage of weight reduction and enhanced child weight outcomes. Likewise, because mothers in the intervention group of this proposed study will receive more support, it is anticipated that their children will show more

improvements in BMI-for-age z-scores and average servings of fruits and vegetables consumed. Gomes et al. (2018) also saw significant improvements in children's healthy food intake after their intervention program; however, researchers found that these healthy habits were not long lasting upon a follow-up. Upon follow-up of the proposed study, it is anticipated that there will be continuous improvement due to the utilization of annual reinforcement sessions with dietitians.

### **Strengths and Limitations**

There are some strengths that can be identified in this study. The participants in this study will all have previously utilized the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC). This helps guarantee that they all have income levels at or below 185% of the annual poverty level. Because all participants have income levels at or below 185% of the annual poverty level, this eliminates the suggestion that one group may have greater differences in data due to them possibly having a higher income level compared to the other group. The collection of BMI-for-age z-scores is another strength of the study, as it can classify a child's weight status. Selection of parents with children whose ages are 4-5 years old is a third strength of this study because the children's BMI-for-age z-score and intake can be compared. It is appropriate for the children in this study's age to be similar in order to compare them against each other. Another strength of the study is the collection of data on weekly servings of fruits and vegetables consumed by children outside of school. This data provides information on how diets of children are changing as an effect of their mothers receiving an intervention program and annual nutrition education reinforcement sessions.

There are several limitations in the proposed study. One limitation is that the training for the nutrition educator only occurs once prior to the start of the study. Another limitation is that the *MyPlate for My Family* program will be taught in person. This can make attendance in the *MyPlate for My Family* program a challenge, as some participants may have trouble finding rides and babysitters. Another limitation will be that follow-up data from this study will not be compared to the baseline data. Although one of the strengths of this study is that it shows how much more effective annual reinforcement sessions can be compared to the control group, it does not show how much of a difference the reinforcement sessions will make since the baseline. Another limitation is that we will not collect any data on typical diets of the participants before, during, or after the program aside from average servings of F&V on a weekly basis outside of school meals. If participants contact dietitians multiple times a year, this is another limitation, as it could skew the results of the study and no longer accurately reflect the study's design.

### **Suggestions For Future Studies**

In future studies, researchers should consider analyzing the effects of the intervention on baseline data compared to post-intervention and follow-up data. This proposed study has a focus on if reinforcement sessions can make greater changes than the control. Dietitians who participate in providing nutrition education reinforcement sessions should have more involvement in teaching the initial program so that they also know what has been taught and can build their reinforcement sessions around what the patient has been taught and what the patient still needs support in. Data collection in future studies should also look at fruit and vegetable intake separately and look at the effect of school on fruit and vegetable consumption. Additionally, future studies should consider using virtual class sessions as alternatives to meeting

in person or having hybrid classes to allow participants flexibility with their schedules. Another suggestion for future studies is to evaluate the quality and effectiveness of the reinforcement sessions by gathering feedback about the *MyPlate for My Family* program and annual reinforcement sessions from participants. Ideally, this would have been included in the study design, however, due to an anticipated limited funding, we are unable to gather feedback from participants.

### Conclusion

Obesity continues to be on the rise in the American population, in children and in adults. Providing resources and annual reinforcement to help mothers develop healthy eating habits in their children will help them reduce their child's BMI-for-age z-scores and increase their child's consumption of fruits and vegetables outside of school meals. Ultimately, a program that allows for reassessment and relearning will provide parents with the guidance and support they need to help their families develop healthy feeding behaviors and healthy eating habits.

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## Appendix A.



United States  
Department  
of Agriculture

USDA MyPlate for My Family Educator Handbook.

# MYPLATE FOR MY FAMILY

SNAP NUTRITION EDUCATION



EDUCATOR'S HANDBOOK

## ACKNOWLEDGMENTS

*MyPlate for My Family*: SNAP Nutrition Education is an initiative of the Food and Nutrition Service (FNS), U.S. Department of Agriculture (USDA). The educational and promotional materials are designed for Supplemental Nutrition Assistance Program (SNAP) participants and low-income individuals eligible for means-tested Federal assistance programs with children ages 2 through 18. The project also includes educational materials for persons delivering SNAP Nutrition Education (SNAP-Ed). However, these materials can be used in other settings with similar target audiences, such as the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC); the Child and Adult Care Food Program (CACFP); and

National School Lunch and Breakfast Programs, to help parents and families follow the Dietary Guidelines for Americans and improve eating and physical activity behaviors.

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## WHAT'S IN THIS HANDBOOK?

MY PLATE FOR MY FAMILY: SNAP NUTRITION EDUCATION	4
DIETARY GUIDELINES FOR AMERICANS AND MY PLATE	6
A LOOK AT THE MATERIALS	11
ADDRESSING LOW LITERACY SKILLS	16
THE INFLUENCE OF CULTURAL NORMS ON NUTRITION HABITS	18
GETTING THE KIDS INVOLVED	19
DEVELOP PARTNERSHIPS WITH SNAP AND OTHER NUTRITION ASSISTANCE PROGRAMS	20
ADDITIONAL RESOURCES	22



## MY PLATE FOR MY FAMILY: SNAP NUTRITION EDUCATION

MyPlate for My Family: SNAP Nutrition Education provides educational and promotional materials to help nutrition educators in their work with English- and Spanish-speaking families with children ages 2 through 18. The resources offer tips and information to help families stretch their food dollars, prepare easy and healthy meals, and be more physically active.

This Educator's Handbook provides an overview of MyPlate for My Family: SNAP Nutrition Education and information on how to use the materials.

This Educator's Handbook serves the following functions:

- Helps nutrition educators implement MyPlate for My Family: SNAP Nutrition Education.
- Provides an overview of the educator and participant resources.

## SUPPORT FOR INDIVIDUALS AND FAMILIES

MyPlate for My Family: SNAP Nutrition Education provides SNAP participants with access to nutrition education based on the Dietary Guidelines for Americans and includes resources from ChooseMyPlate.gov. This user-friendly toolkit can support low-income individuals and families by offering tips and tools for making better food choices and being more physically active. The toolkit is designed to promote the following behaviors:

- Eat foods from all five food groups every day
- Eat less solid fats, added sugars, and sodium every day
- Be physically active

## SUPPORT FOR EDUCATORS AND PROFESSIONALS

Providing nutrition education to many different types of people who often are going through hard times can be a challenge. This toolkit offers materials especially for the SNAP-Ed audience that include the following:

- Background on audience educational needs
- Guidance for teaching relevant, understandable, and achievable behaviors
- Resources to support nutrition education efforts





## DIETARY GUIDELINES FOR AMERICANS AND MY PLATE

The Dietary Guidelines for Americans are the basis of Federal food, nutrition education, and information programs. They provide science-based advice to promote health and to reduce risk for chronic disease through diet and physical activity. The recommendations in the Dietary Guidelines are for healthy people<sup>1</sup> over 2 years of age and support the basic premise that nutrient needs should be met primarily through consuming foods.



The MyPlate symbol is a simple reminder to help people eat healthier. The symbol is supported by behavior-specific messages to help consumers make positive food and physical activity choices. Educators can find more information by visiting [ChooseMyPlate.gov](http://ChooseMyPlate.gov).



Individuals with a chronic health condition should talk with a health care provider to determine what dietary pattern is appropriate for them. Pregnant women should also follow the advice of their health care provider regarding food and physical activity recommendations.

### BEHAVIOR-SPECIFIC MESSAGES

- Make half your plate fruits and vegetables.
- Switch to fat-free or low-fat (1%) milk (dairy).
- Make at least half your grains whole grains.
- Compare sodium, sugars, and saturated fats in foods and choose the foods with lower numbers.
- Enjoy your food, but eat less.
- Avoid oversized portions.
- Be active your way.
- Drink water instead of sugary drinks.

### CALORIE LEVELS

Throughout this toolkit, a 2,000-calorie level is used as a reference for consistency with the Nutrition Facts label on food products. Although this calorie level is used as a reference, recommended calorie intakes will differ for individuals based on age, gender, and physical activity level. For example, the chart below shows three different calorie levels and the amount of food from each food group that might be appropriate for a young child (8 years or younger), a woman (19-50 years), and a teenage boy (14-18 years).

#### DAILY AMOUNT OF FOOD FROM EACH GROUP\*

Calorie Level	1,400 (young child, 8 years or younger)	2,000 (woman, 19-50 years)	2,800 (teen boy, 14—18years)
<b>Fruits</b>	1.5 cups	2 cups	2.5 cups
<b>Vegetables</b>	1.5 cups	2.5 cups	3.5 cups
<b>Grains</b>	5 ounce-equivalents	6 ounce-equivalents	10 ounce-equivalents
<b>Protein Foods</b>	4 ounce-equivalents	5.5 ounce-equivalents	7 ounce-equivalents
<b>Dairy</b>	2.5 cups	3 cups	3 cups

\*These are approximate amounts and may vary depending on exact age, gender, and physical activity /eve/ of each person.



## CHOOSEMYPLATE.GOV

ChooseMyPlate.gov is a comprehensive website that offers resources and tools to help guide your nutrition education audiences. The site provides detailed information about all of the food groups including commonly eaten foods, the amount of each food group needed per day, health benefits, and tips to help participants make good choices. Information about preparing foods and an extensive number of consumer-friendly recipes are also available to help participants apply what they learn during their educational experiences. Participants can access printable resources that focus on relevant nutrition and physical activity topics throughout the lifecycle including pregnancy, breastfeeding, early childhood, school age, and various stages of adulthood.

Professionals and educators will find diet and physical activity information for each participant to help them conduct nutrition education sessions or expand information for their nutrition education programs. You are encouraged to review and become familiar with ChooseMyPlate.gov and related content.

ChooseMyPlate.gov can help participants and educators to:

- Work independently to address questions raised during nutrition education sessions.
- Obtain information for other family members.
- Select educational items and activities for children.
- Identify healthy lifestyle options for the entire family.

ChooseMyPlate.gov offers resources for Spanish-speaking consumers. Click on the “En Espanol” link in the consumer section.

For participants who don't have access to a computer or the Internet, you can help them by downloading resources and offering them as handouts. Keep in mind that some of the information may not be appropriate for all literacy levels.



## CHOOSEMYPLATE.GOV HIGHLIGHTS

Dietary Guidelines 2010 Consumer Brochure—*Let's Eat for the Health of It...* provides concise information about how to build a healthy plate; cut back on foods high in solid fats, added sugars, and salt; eat the right amount of calories; and be more physically active.

Selected Consumer Messages—Seven key consumer messages from the 2010 Dietary Guidelines for Americans that support the Dietary Guidelines Communications Initiative.

10 Tips Nutrition Education Series—A series of tip sheets that address simple ways to make changes to improve nutrition and physical activity behaviors.

SuperTracker—An online diet and physical activity tracking tool available through ChooseMyPlate.gov that allows participants to enter their age, gender, and activity level and generate a plan that is specific to their calorie and nutrient needs.

Recipes, Cookbooks, and Menus—Recipes from a variety of nutrition assistance program sources including the SNAP-Ed Connection to help you conduct food demonstrations, provide healthy samples for participants, or share handouts to reinforce the information provided during nutrition education sessions.

MyPlate Community Toolkit—USDA toolkit to help communities to get involved in addressing the trend of childhood obesity and creating healthier environments.

Daily Food Plans—Plans for individuals based on sex, age, height, weight, and physical activity level. All Daily Food Plans and their associated worksheets are available for download.

MyPlate Graphics Standards—A style guide that explains how to use the MyPlate icon.

Nutrition Facts Label—An important educational tool available on food packages or products.

Healthy Eating on a Budget—A resource to help families plan, purchase, and prepare meals, available at ChooseMyPlate.gov.

MyPlate Mini-Poster—Provides information about what and how much to eat from all five food groups based on a 2,000-calorie food plan.

MyPlate Kids' Place—Provides online resources and tools for children to help them make wise choices in a fun and appealing way.



## A LOOK AT THE MATERIALS

*MyPlate for My Family* includes an informational brochure, the Educator's Guide, four Discussion Sessions, take-home handouts with recipes, and resources from ChooseMyPlate.gov. This Educator's Guide is provided to help you understand how to deliver *MyPlate for My Family* to your audiences. The sections of the handbook called *Addressing Low Literacy Skills* (page 16) and *Cultural Considerations When Working With Spanish-Speaking Participants* (page 17), provide additional information to assist clients with limited English skills and diverse social needs. The information below details the materials available for clients and educators. Related resources from ChooseMyPlate.gov are also listed to complement your nutrition education efforts.







## EDUCATIONAL TOOLS

MyPlate for My Family: SNAP Nutrition Education brochure provides an overview of the toolkit and highlights nutrition behaviors that are important for achieving a healthier lifestyle. Based on the Dietary Guidelines for Americans, this brochure offers information to help educators facilitate nutrition education sessions. Organizations or agencies can place local contact information on the brochure to assist with program efforts. Share this brochure with clients or participants to remind them about the nutrition education opportunities and reinforce nutrition and physical activity behaviors.

The four Discussion Sessions and participant handouts include resources to help you conduct educational sessions with SNAP participants and eligible consumers. The Discussion Sessions and handouts are designed to help the adult learner use the nutrition information and offer tips to help them take action to improve eating and physical activity behaviors. The handouts also provide suggestions to help your audiences apply what they've learned at home. Handouts from ChooseMyPlate.gov are also included with the Discussion handouts to further support session topics. All of the Discussion Sessions are planned for groups of 5 to 7 participants, and each session can be completed in about 45 minutes.

## DISCUSSION SESSION



## BEHAVIORAL OBJECTIVES

Identify and use at least two timesaving or low-cost ways to prepare healthy family meals each week.

Name two tasks a child can do to help make a family meal during the week.



- Identify ways to plan and prepare healthy meals.
- Identify and commit to at least one action to get the right amount of food from all five food groups.
- Identify and commit to at least one action to help family members be physically active during the week.



- Identify at least two new vegetables and two new fruits to eat during the upcoming week.
- Identify at least one way to encourage children to eat a variety of fruits and vegetables each day.

Recognize what 1 cup of vegetables and 1 cup of fruits look like.



- Identify and commit to two ways to get 2 1/2 hours of physical activity during the week.
- Identify two ways to help their kids be physically active, every day.



## TOOLS FOR YOUR AUDIENCE

The take-home handouts reinforce important nutrition information in a way that is appropriate for both English- and Spanish-language speakers. The handouts help participants understand relevant Dietary Guidelines recommendations for a healthier lifestyle. These handouts provide information about the amount of food to eat each day from each food group; tips on buying foods on a budget; making small, simple changes; motivating children to eat healthier foods; and being physically active every day.

Optional MyPlate take-home handouts are suggested for all of the Discussion Sessions. The handouts focus on children to help them adopt healthy eating or physical activity behaviors. The MyPlate mini-poster is also useful for most of the Discussion Sessions. Find the mini-poster and optional handouts at [www.ChooseMyPlate.gov/myplateformyfamily.html](http://www.ChooseMyPlate.gov/myplateformyfamily.html).



## DISCUSSION SESSION TAKE-HOME HANDOUT (ENGLISH AND SPANISH)



1. Make Easy and Healthy Family Meals
2. Make Half Your Grains Whole Grains
3. Get Your Dairy
4. Look for Lean Protein Foods

Optional MyPlate handout:  
MyPlate Coloring Page



1. Find and Make Healthy Foods in a Snap
2. Watch Your Solid Fats, Sugars, and Sodium
3. Food and Physical Activity Checklist

Optional MyPlate handout:  
MyPlate Snack Tips for Kids



1. What Counts as 1 Cup?
2. Choose Your Veggies
3. Keep Fruits Handy

Optional MyPlate handout:  
Word Search: Have Fun With Fruits and Vegetables



1. Be Active Today

Optional MyPlate handout:  
Be a Fit Kid



## ADDRESSING LOW LITERACY SKILLS

People fall into a literacy continuum for different types of skills. The materials within this toolkit have been developed and designed to facilitate learning for those with limited reading and literacy skills. According to the National Assessment of Adult Literacy (NAAL), released in 2006 by the U.S. Department of Education, 30 million adults struggle with basic reading tasks.

15

The assessment<sup>1</sup> also found that nearly 9 out of 10 adults may lack many of the skills necessary to sufficiently manage their health. Low health literacy can affect a person's ability to locate health care providers and services, fill out health forms, share personal health information with providers, manage chronic diseases, and engage in self-care. Some of the key design features to make the *MyPlate for My Family* participant materials more user-friendly include:

- Reading levels that are at or near 5th grade level.
- Full-color images to help communicate key information.
- Use of real world examples and tips to make the instructions clear.

Some individuals participating in SNAP have low literacy skills that may make it difficult for them to understand information offered during a nutrition education session. The U.S. Department of Education, Office of Vocational and Adult Education provides more insights about the needs of this audience and resources to assist educators and professionals in delivering services. The Literacy Information and Communication System (LINCS) is an initiative of the U.S. Department of Education designed to expand evidence-based practice in

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<sup>1</sup> Kutner, M., Greenberg, E., Jin, Y., and Paulsen, C. (2006). *The Health Literacy of America's Adults: Results From the 2003 National Assessment of Adult Literacy (NCES 2006-483)*. U.S. Department of Education. Washington, DC: National Center for Education Statistics.

the field of adult literacy. LINCS features development opportunities, training, and resources that can be obtained by visiting the website, <http://lincs.ed.gov/>.

## CULTURAL CONSIDERATIONS WHEN WORKING WITH SPANISH-SPEAKING PARTICIPANTS

*MyPlate for My Family* provides nutrition education information to Spanish-speaking SNAP participants and eligible consumers. Culture can affect how people understand and respond to health messages. Some factors that influence nutrition education for Spanish-speaking participants are related to their values and literacy skills in both English and Spanish. Hispanics in the United States are a multicultural population, having migrated from different countries with a variety of cultural values and language needs.

While the *MyPlate for My Family* is not designed as a cultural competency training, the materials reflect messages based on findings from the SNAP research phase of the previous version of the *MyPlate for My Family* (formerly known as *Loving Your Family, Feeding Their Future*) development. To better reach Hispanic audiences, seek advice from local groups and community

Below are several cultural considerations to help you deliver effective nutrition education to Spanish-speaking audiences.

- Help people to share and discuss personal experiences
- Encourage extended family to participate in the education (i.e., include grandparents if they provide care for a participant's child)
- Build on Hispanic cultural values and attitudes
- Support practices that promote cultural traditions
- Engage relevant community services and role models
- Use plain language that includes clear descriptions and specific terms (e.g., chicken, rather than poultry)
- Use images that are culturally relevant to the audience
- Add culturally familiar foods or activities to educational sessions

organizations that provide services to your audiences. If you are not fluent in Spanish, develop relationships with a qualified translator who can assist you.<sup>3</sup>

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<sup>3</sup> Simply Put: A Guide for Creating Easy-to-Understand Materials. Third Edition. (July 2010). Centers for Disease Control and Prevention; Office of the Associate Director for Communication; Division of Communication Services.





## THE INFLUENCE OF CULTURAL NORMS ON NUTRITION HABITS

Society and cultural norms influence participants' abilities to adopt healthier lifestyles. Generally, contemporary, fast-paced lifestyles and the media influence food patterns and physical activity practices.

Preparing food at home can help parents provide healthier meals and snacks for their children. Encourage parents to think about the foods they offer their children and discuss ways that busy parents can provide quick meals on hectic days. Help parents think about how food is advertised to their children and provide alternatives to inexpensive, high-calorie foods.



Many modern conveniences make it easier for families to avoid physical activity in the course of everyday lives. These conveniences include cars, elevators, television, computers, mobile devices, and fewer labor-intensive jobs. Use the resources included in this kit to help families plan physical activity with their children and find solutions to challenges presented by participants.

### Media Influences on Children

- Food advertising and promotions are prominent features of the commercial mainstream.
- Children are often the targets of food advertising that promotes high-calorie foods.

## GETTING THE KIDS INVOLVED

Children often influence which foods are purchased and how they are prepared at home. Encourage parents to engage their kids in healthy food practices and active lifestyles. Below are some suggestions to help parents and caregivers get kids involved.

- **Kids will follow a parent's example, if it is consistent.** When parents choose healthier foods and are more physically active, their kids are more likely to do the same. Encourage parents to adopt healthier practices, so that their children can learn from them.
- **Encourage parents to have healthier foods in the house.** Discuss how SNAP benefits can empower families to purchase healthy, affordable foods. During sessions, demonstrate how to prepare meals and snacks so that parents learn how to make healthy food at home. Additional Resources are listed at the end of the Educator's Handbook to assist you in conducting food demonstrations.
- **Share the benefits of family meals.** Meals are a valuable way to spend time together, break up

busy days, and provide opportunities for families to "catch up on things." Parents can also use meal times to talk about foods and plan fun active time. Parents can encourage children to discuss foods they like to eat or activities they would like to try. Family meals also provide an opportunity for adults to model good eating habits or introduce new foods.

- **Teach parents the value of**

- Kids need at least 60 minutes of physical activity every day.
- Adults need at least 2½ hours of physical activity during the week.
- Regular physical activity reduces the risk of chronic diseases such as heart disease and diabetes.

**being physically active with their children.** Parents can help their children to be more active by participating in activities with

them and modeling fun, easy, activities every day.

- **Discuss ways that parents and caregivers can play with children and keep them active.**

Offer suggestions such as outdoor

games like basketball, soccer, or playing tag with friends. Provide information about free or affordable local programs that offer physical activity.



## DEVELOP PARTNERSHIPS WITH SNAP AND OTHER NUTRITION ASSISTANCE PROGRAMS

SNAP nutrition education is often provided at locations other than where recipients receive SNAP benefits. The result is that program participants are not aware of the relationship between SNAP benefits and available nutrition education classes.

Communicate and network with the various SNAP staff members who work with participants to build a partnership that strives to achieve common goals associated with nutrition education. Reach out to SNAP offices to identify referrals for nutrition education.

SNAP participants come in contact with many organizations, institutions, and individuals that can promote nutrition education resources and services. Use this toolkit to influence and work with partners at the local, State, and national levels. Develop partnerships with

other nutrition assistance programs and organizations that work with SNAP participants. These programs and organizations could serve as potential sites where nutrition education may be provided. Partners can also help improve awareness about SNAP nutrition education and support your effort to provide services in your community.



**To improve partnerships:**

- Provide the informational brochure, *MyPlate for My Family*, to frame the initiative as a nutrition education offering to local SNAP offices, FNS nutrition-related programs, and other community sites.
- Meet with non-nutrition, professional, paraprofessional, and clerical staff to introduce the initiative, review the value of nutrition education, and solicit support.
- Hold in-service orientations for local staff associated with other nutrition programs, such as WIC and Child Nutrition Programs.

**POTENTIAL SITES FOR NUTRITION EDUCATION SESSIONS****ADULT SETTINGS:**

- Local SNAP and employment training offices
- Food banks and pantries
- Job training centers and work sites
- Housing authority locations
- Faith-based organizations
- Farmers Markets that accept Electronic Benefit Transfer (EBT)
- WIC clinics
- Grocery stores that accept EBT
- School PTAs in low-income schools
- Head Start centers
- Health clinics and public health programs

**CHILDREN'S SETTINGS:**

- Low-income public schools (K through 12)
- Children centers
- Preschool programs
- After school programs
- Head Start centers
- Youth recreation programs

## ADDITIONAL RESOURCES

*MyPlate for My Family* offers the following additional resources to help you deliver nutrition education to SNAP audiences.

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Dietary Guidelines for Americans

<http://www.cnpp.usda.gov>

MyPlate Resources <http://www.ChooseMyPlate.gov>

SNAP-Ed Connection <http://snap.nal.usda.gov>

What's Cooking? USDA Mixing Bowl

<http://www.whatscooking.fns.usda.gov>

Team Nutrition <http://www.fns.usda.gov/tn/team-nutrition>

WIC Works Resource System

<http://wicworks.nal.usda.gov>

HealthierFinder.gov <http://www.healthfinder.gov>

Federal Resource for Nutrition Information

[Nutrition.gov](http://Nutrition.gov)

The Centers for Disease Control and Prevention (CDC) <http://www.cdc.gov>

The U.S. Food and Drug Administration's (FDA)

<http://www.fda.gov>

The National Agricultural Library (NAL)

<http://www.nal.usda.gov>

Simply Put: A Guide to Creating Easy to Understand Materials

[http://www.cdc.gov/healthliteracy/pdf/simply\\_put.pdf](http://www.cdc.gov/healthliteracy/pdf/simply_put.pdf)

SNAP Food Demonstration Tips <http://snap.nal.usda.gov/recipes/food-demonstration-tips>



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Individuals who are deaf, hard of hearing, or have speech disabilities and wish to file either an EEO or program complaint please contact USDA through the Federal Relay Service at (800) 877-8339 or (800) 845-6136 (in Spanish).

Persons with disabilities who wish to file a program complaint, please see information above on how to contact us by mail directly or by email. If you require alternative means of communication for program information (e.g., Braille, large print, audiotape, etc.) please contact USDA's TARGET Center at (202) 720-2600 (voice and TDD).

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## Appendix B.

Handouts to be emailed to all participants every quarter.



### ► MAKE EASY AND HEALTHY FAMILY MEALS!

A few steps can help you make easy, healthy family meals on a budget. Find time to plan and prepare healthier meals each week. Use the time you save to enjoy your family.

#### ► PLAN

Plan your family meals. Think about meals, snacks, and beverages you will serve throughout the week. Write down a list of foods you need to prepare your meals or keep the list in a wallet, purse, or on a mobile phone. Focus your budget on foods that are healthier for your family such as vegetables, fruits, whole grains, dairy, and protein foods.

- **Use a shopping list to stay on track.** Review coupons and sales to find less expensive foods. Look in newspapers or weekly store flyers to find sales and coupons for foods that you need. 💰
- **Join a store's bonus or reward card program to receive more savings.** Visit the store's customer service desk or website for information about how to sign up. 💰
- **Choose foods that cost less all year long.** Beans and eggs are low-cost healthy protein foods. Frozen vegetables like spinach and green beans are also low-cost options. 💰
- **Stock your kitchen.** Select foods that you can make and serve quickly on busy days, such as:
  - Canned beans and fish
  - Canned low-salt or low-sodium vegetables or soups
  - Whole-grain pasta, brown rice, and quick-cooking oats

- **Store fresh foods right away to keep them fresh longer.** Use fresh fruits, vegetables, and milk quickly to prevent them from spoiling.
- **Buy fruits and vegetables in season.** Some fruits and vegetables, such as peaches or corn, are cheaper when you buy them in season. Look for sales in the grocery store and your local farmers markets for cheaper choices. Many farmers markets accept SNAP benefits. 💰



Keep ingredients such as seasonings, flour, baking powder, herbs, and oils in your pantry to help you quickly prepare healthy meals.

#### 💰 BUDGET-FRIENDLY TIP

HANDOUT:  
MYPLATE FAMILY MEALS

### ► PREPARE

Do some tasks in advance. Make meals on the weekends when you have more time. Prepare extra and freeze some meals to use later in the week. Find ways to save yourself time during the weekdays when everyone is busier.

- **Look for shortcuts.** Grated, chopped, or pre-washed foods cost more but often save time in the kitchen. Compare prices on these items. Look for sales on easy to prepare foods such as frozen veggies or mixed salads. 💰
- **Prepare a meal that kids and adults will enjoy.** Try not to make a separate meal for each person. If your child likes plain vegetables, meat, rice, or noodles, set some aside before you add other ingredients.
- **Serve no-cook meals.** Make simple meals like salads with canned tuna and beans or cold sandwiches with lean meats and sliced vegetables. Find information about meal planning, shopping, and creating healthy meals at [ChooseMyPlate.gov/budget/index.html](http://ChooseMyPlate.gov/budget/index.html).
- **Cook when you have more time.** On the weekends, make soups, stews, or casseroles. Cook larger amounts of lean ground beef or turkey and use some for chili or spaghetti later in the week. Freeze some of your meals for really hectic days.
- **Look for recipes with fewer ingredients.** Choose recipes with only a few ingredients that can be prepared quickly. Visit [WhatsCooking.fns.usda.gov](http://WhatsCooking.fns.usda.gov) for ideas.
- **Involve kids in family meals.** Let children help with simple tasks like washing fruits, choosing the veggies, setting the table, or measuring foods. On busy weekdays, give everyone a task to help you get dinner on the table.



Farmers markets often carry foods grown locally. Find a local market near you by visiting: [search.ams.usda.gov/farmersmarkets](http://search.ams.usda.gov/farmersmarkets)



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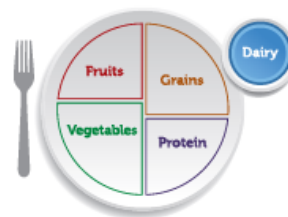
## ► GET YOUR DAIRY

Dairy foods offer important nutrition for you and your family. Choose low-fat or fat-free dairy foods to get the calcium and vitamin D your body needs for strong teeth and bones. If you can't drink milk, try calcium-fortified soymilk (soy beverage), low-fat yogurt, cheese, or calcium-enriched foods. Adults and children who need 2,000 calories daily should eat or drink about 3 cups of dairy each day.

Serve different types of dairy such as:

- 1 cup of low-fat milk on cereal (counts as 1 cup of dairy)

- ½ cup of calcium-fortified soymilk with your meal (counts as ½ cup of dairy)
- 1 cup of low-fat plain yogurt (counts as 1 cup of dairy)
- 1 slice (1 ounce) of low-fat cheddar cheese on a sandwich (counts as ½ cup of dairy).



## ► TIPS TO GET YOUR DAIRY

**Make the switch to low-fat and fat-free milk.** Some kids and adults may need to make the change from full-fat dairy slowly. First, switch from whole to 2% milk (reduced-fat). Later, change to low-fat (1%) or skim (fat-free) milk.

**Keep dairy food on your shopping list.** Keep a list of dairy foods that your family will eat such as low-fat milk or yogurt. Check online and look at your grocery receipt for coupons to help you save more on dairy foods. 💰

**Use low-fat plain yogurt for toppings and sauces.** Some foods are not part of the dairy food group, like cream, sour cream, cream cheese, and butter. They are high in solid fat and have little or no calcium. Add low-fat or fat-free milk to your coffee

or tea instead of cream. Use low-fat yogurt instead of sour cream for cooking.

**If you have trouble drinking milk, try soymilk (soy beverage).** If you don't or can't drink cow's milk, fortified soymilk is a great choice.

**Add a little cheese to meals and snacks.** Look for lower fat cheeses like part-skim mozzarella, or reduced-fat Swiss or cheddar. Serve low-fat choices with foods like sliced cucumbers, apples, or 100% whole-grain crackers.

**Show kids that dairy is important.** Make a point to eat and drink dairy foods daily. Chocolate milk, flavored yogurt, frozen yogurt, and pudding have calcium but also a lot of added sugar. Serve them on special days and less often.

💰 BUDGET-FRIENDLY TIP

To find the right amount of dairy foods for members of your family, visit <http://choosemyplate.gov/supertracker-tools/daily-food-plans.html> or [SuperTracker.usda.gov](http://SuperTracker.usda.gov).

HANDOUT:  
MYPLATE FAMILY MEALS



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## ▶ BATIDO SMOOTHIE

**TOTAL TIME:** 10 minutes

**MAKES:** 4 servings

**INGREDIENTS:**

- 2 cups papaya chunks, fresh or frozen\*
- 2 bananas, overripe and sliced
- 1 cup yogurt, plain low-fat\*\*
- 1 cup ice cubes

**DIRECTIONS:**

1. Put all the ingredients in the blender.
2. Put the lid on tightly. Turn the blender to a medium setting and blend about 1 minute until the ice is chopped and the mixture is smooth.
3. Serve right away, or cover and refrigerate up to 4 hours.

\*Frozen or fresh strawberries, blueberries, or raspberries can be used in addition to or instead of papaya.

\*\*Low-fat milk, soy, rice, almond, or coconut milk can be used instead of yogurt.



**NUTRIENTS PER SERVINGS:**

Calories 118, Protein 4 g, Dietary Fiber 3 g, Total Fat 1 g, Saturated Fat 1 g, Cholesterol 4 mg, Sodium 46 mg.



For more recipes visit  
[WhatsCooking.fns.usda.gov](http://WhatsCooking.fns.usda.gov).



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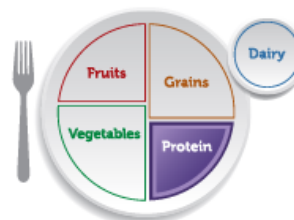
## ► LOOK FOR LEAN PROTEIN FOODS

Protein foods include meat, poultry, fish and other seafood, beans, eggs, nuts and seeds. Most of us eat enough protein every day. Eating both animal and plant sources offers variety and can help you stay within your budget. Adults and children who need 2,000 calories daily should eat about 5½ ounces of protein foods each day.

Include protein foods such as:

- **One whole egg** (counts as 1 ounce of protein)

- **½ cup cooked black beans** (counts as 2 ounces of protein)
- **One half of a small chicken breast** (counts as 2 to 3 ounces of protein)



## ► TIPS ON CHOOSING LEAN PROTEIN FOODS:

**Trim the extra.** Much of the fat in chicken and turkey is in or under the skin. Remove skin and fat for a leaner meal. Compare prices for lean meats with the fat already trimmed or poultry with the skin removed. 💰

**Add a few nuts to your meal or snack.** Nuts are a good source of protein but can be high in calories. Keep your servings small—1 ounce of almonds is about 20 to 24 nuts. Try peanut butter on apple slices, celery, or 100% whole-grain crackers.

**Fry foods less often.** Bake, broil, or microwave lean beef, pork, chicken, and turkey. You can use a lot less oil by cooking in an oven or microwave. Make protein foods with little or no added fat.

**Try eating seafood at least 2 times per week.** Buy fresh or canned fish, like tuna or salmon, when it's on sale. Canned fish usually costs less. 💰

**Buy choices that fit your budget.** Serve low-cost protein foods like beans, peas, and eggs to save money. Stock up on canned beans and peas when they are on sale. 💰

**Keep your food safe!** Wash your hands, utensils, and cutting boards before and after contact with raw meat, poultry, seafood, and eggs.

💰 BUDGET-FRIENDLY TIP

To find the right amount of protein foods for members of your family, visit <http://choosemyplate.gov/supertracker-tools/daily-food-plans.html> or [SuperTracker.usda.gov](http://SuperTracker.usda.gov).

HANDOUT:  
MYPLATE FAMILY MEALS



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## ► MEDITERRANEAN CHICKEN AND WHITE BEAN SALAD

**TOTAL TIME:** 20 minutes

**MAKES:** 4 servings

**INGREDIENTS:**

- 1 cup cooked chicken thighs, skinless, diced into ½-inch pieces
- 1 (15.5-ounce) canned white beans, low-sodium, drained
- 1 cucumber, peeled, diced into ½-inch pieces
- ¼ onion, peeled, chopped into ½-inch pieces
- 2 tablespoons vegetable oil
- ¼ cup lemon juice
- 1 tablespoon dried or fresh basil
- ¼ teaspoon salt
- ¼ teaspoon black pepper

**DIRECTIONS:**

1. Put everything in the bowl and gently toss.
2. Additional vegetables can be added such as ½ cup of diced bell pepper or ½ cup of celery.
3. Serve right away or cover and refrigerate up to 2 days.



**NUTRIENTS PER SERVING:**

Calories 297, Protein 20 g, Dietary Fiber 8 g, Total Fat 11 g, Saturated Fat 2 g, Cholesterol 32 mg, Sodium 546.



For more recipes visit  
[WhatsCooking.fns.usda.gov](http://WhatsCooking.fns.usda.gov).



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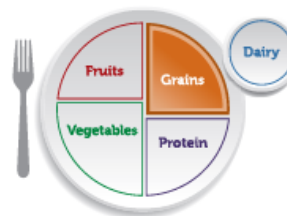
## ► MAKE HALF YOUR GRAINS WHOLE GRAINS

The grains group includes breads, cereals, rice, and pasta. All grains are made with some of the grain kernel but whole grains include the entire kernel. When parts of the grain are removed, it is called a refined grain. Enriched grains have nutrients added back in. Both whole grains and enriched grains provide good nutrition. Whole grains often have more fiber, which helps to keep your body regular. Adults and children who need 2,000 calories should eat about 6 ounces of grains each day. Three of those ounces should be whole-grain.

Serve a variety of grains such as:

- **1 cup of 100% whole-wheat flakes** (counts as 1 ounce of whole grains).

- **Two slices of 100% whole-wheat bread in a sandwich** (counts as 2 ounces of whole grains).
- **1 cup of cooked rice** (counts as 2 ounces of grains).
- **One medium corn tortilla** (counts as 1 ounce of grains).



## ► TIPS ON EATING WHOLE GRAINS

**Make at least half your grains whole grains.** Use whole-grain bread in sandwiches, mix brown rice with vegetables, and use whole-wheat pasta in dishes like spaghetti.

**Eat whole grains to keep you on track.** Many whole grains provide health benefits, like fiber, which helps to keep the body regular.

**Check the package.** Look on the package and ingredient list for the words "100% whole grain" or "100% whole wheat." Some grains say "bran" or "100% wheat" and may not contain any whole grain. Brown or dark colors are not a sign that foods are made with whole grains.

**Try whole grains for breakfast!** Choose whole-wheat cereal, oatmeal, or whole-grain waffles.

**What about whole-grain snacks?** Try whole-grain cereals such as shredded wheat or toasted oats. Popcorn is a great snack, when made with little or no butter or salt.

**Give kids whole-grain foods without the extras.** Many grain foods such as cookies, cakes, pies, and donuts have a lot of solid fats and added sugars. Serve these foods less often.

To find the right amount of grains for members of your family, visit <http://choosemyplate.gov/supertracker-tools/daily-food-plans.html> or [SuperTracker.usda.gov](http://SuperTracker.usda.gov).

HANDOUT:  
MYPLATE FAMILY MEALS



## ► STIR-FRIED GREEN RICE, EGGS, AND TURKEY HAM

**COOK TIME:** 1 hour and 20 minutes

**MAKES:** six 1-cup servings

### INGREDIENTS:

- 1¾ cups brown rice, long-grain, regular, dry
- ½ tsp salt
- ¾ cup frozen chopped spinach, thawed, drained
- 6 large whole eggs, beaten
- 1 tablespoon vegetable oil
- ½ cup extra-lean turkey ham, diced ¼" (2 ounces)
- ¼ cup fresh green onions, diced
- 1 teaspoon sesame or vegetable oil
- 1 teaspoon low-sodium soy sauce

### DIRECTIONS:

1. Combine brown rice and 4½ cups water in a large pot and bring to a boil. Turn heat down to low. Cover and cook about 30-40 minutes, until water is absorbed. Fluff with a fork. Add salt to rice. Mix well. Set aside. (A rice cooker may be used with the same quantity of brown rice and water.)
2. Drain water from spinach by squeezing thawed spinach with hands. Set aside.
3. Whisk together eggs and 1 tablespoon of water. Cook half of the eggs in a large nonstick skillet coated with nonstick cooking spray. Remove eggs from skillet to cool. Chop cooled eggs and set aside. Reserve the remaining eggs for step 5.
4. Heat vegetable oil in a wok or a large nonstick skillet over high heat. Add ham and cook for 2 minutes or until ham begins to brown.
5. Reduce heat to medium. Add brown rice and toss to mix. Add remaining eggs. Stir for 5 minutes or until egg is fully cooked. Add green onions, spinach, chopped egg, sesame oil, and soy sauce. Stir well. Cook until thoroughly heated. Serve hot.



### NUTRIENTS PER SERVING:

Calories 238, Protein 9 g, Dietary Fiber 3 g, Total Fat 7 g,  
Saturated Fat 1 g, Cholesterol 74 mg, Sodium 313 mg.  
(Team Nutrition, *Recipe for Healthy Kids: Cookbook for Homes*)



For more recipes visit  
[WhatsCooking.fns.usda.gov](http://WhatsCooking.fns.usda.gov).



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## ► BE ACTIVE TODAY

Eating healthier foods is important, but we also need to be physically active. Adults should try to be active most days of the week. Children should try to be active every day. Think about activities you enjoy and find ways to move throughout the day. Some physical activity is better than none at all.

- Adults need to be physically active for at least 2½ hours during the week.
- Kids need at least 60 minutes of physical activity every day.
- Children 2 to 5 years old should play actively throughout the day.

Find ways to be active your way. Adults should do some type of moderate-intensity activity throughout the week. You may need more physical activity to lose or maintain a healthy weight. See below for ideas:

- Walking briskly
- Jogging
- Dancing
- Bicycling
- Gardening

## ► TIPS FOR BEING PHYSICALLY ACTIVE

**Start slow.** If you are just getting started, you can start slowly by doing 10 minutes of activity at a time. Add more time and intensity as you get stronger. A local library may offer free videos or you can find videos online to get you started. 💰

**Walking works.** Walk in an area that is comfortable for you like in your neighborhood, at a park, or in the mall. If your child's school is nearby, walk with him or her to school.

**Look for activities in your community.** Check a local community center or place of worship for free or low-cost exercise programs, fitness classes, and activities for you or your kids. Join a group that focuses on being active such as a walking club. 💰

**Move throughout the day.** Take the stairs instead of the elevator. Walk the dog instead of letting the dog outside. Do push-ups and sit-ups as you listen to your favorite song. Park farther away from the store, so you can add steps to your day.

**Build stronger muscles.** Yoga and lifting light weights are good ways to build your muscles. Try doing strength-building activities at least 2 days each week.

**Be active at any age.** Everyone benefits from physical activity. You can play with your toddler in the yard or walk with a grandparent to the bus. Play sports like soccer with other adults in your community or enjoy a game of tag with your kids.

### 💰 BUDGET-FRIENDLY TIP

Even if your family is busy, there are many ways to be active. Being more physically active can help you feel better about yourself and give you more energy. Look for friends, family, or members in your community who will support your efforts to move more.

HANDOUT:  
*FAMILY TIME—ACTIVE AND FUN!*



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## ► CHIC' PENNE

**COOK TIME:** 40 minutes

**MAKES:** six 1½-cup servings

### INGREDIENTS:

- 3 cups penne pasta, whole-wheat, dry (12 ounces)
- 1 teaspoon granulated garlic
- 2 cups fresh broccoli florets
- 1 cup cooked diced chicken, ½-inch pieces (4 ounces)
- 1½ cups fat-free half-and-half
- 1 tablespoon enriched all-purpose flour
- ½ cup low-sodium chicken broth
- 1 teaspoon salt
- ½ teaspoon ground black pepper
- 1 cup reduced-fat cheddar cheese, shredded (2 ounces)

### DIRECTIONS:

1. Preheat oven to 350 °F.
2. In a large pot, bring 2 quarts of water to a boil. Gradually stir in pasta and return to a boil. Cook uncovered for 8-10 minutes or until tender. Do not overcook. Drain well. Toss pasta with ½ teaspoon garlic.
3. Fill a medium pot with water and bring to a boil. Add broccoli florets and cook for 5 minutes. Drain well. Sprinkle with remaining garlic.
4. Transfer pasta and broccoli to a medium casserole dish (about 8" x 11") coated with nonstick cooking spray. Add chicken. Mix well.
5. In a small mixing bowl, mix ½ cup half-and-half with flour. Whisk to remove lumps.
6. In a medium skillet, heat chicken broth, salt, pepper, and remaining half-and-half. Stir constantly. Stir in half-and-half/flour mixture. Stir constantly and bring to a boil.
7. Reduce heat to low. Stir frequently for 5 minutes. Sauce will thicken. Add cheese and stir until cheese melts. Remove from heat. Pour sauce over broccoli/pasta mixture.
8. Cover casserole dish with lid or with foil. Bake at 350 °F for 8 minutes. Remove from oven. Serve hot.



### NUTRIENTS PER SERVING:

Calories 300, Protein 19 g, Dietary Fiber 6 g, Total Fat 6 g, Saturated Fat 2 g, Cholesterol 26 mg, Sodium 418 mg

(Team Nutrition, Recipe for Healthy Kids: Cookbook for Homes)



For more recipes visit  
[WhatsCooking.fns.usda.gov](http://WhatsCooking.fns.usda.gov).



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## ► FIND AND MAKE HEALTHY FOODS IN A SNAP

Finding low-cost, healthy foods is important for many families. Use your SNAP benefits to stretch your food dollars and create tasty, healthy meals for your family. When you are shopping at the grocery store, use the information on food labels to help you make choices. Make meals at home, where you can control what is in your foods.

### USE FOOD LABELS

- **Read the Nutrition Facts label.** The Nutrition Facts label has a lot of useful information and can help you get the right amount of calories. The Nutrition Facts label includes nutrition information for a 2,000-calorie diet. Some adults and older children need about 2,000 calories a day. Toddlers and young children need to eat less. Inactive adults and older adults may also need fewer calories.
- **The serving size and number of servings are important.** Calories, fat, sugar, and sodium are shown. Look for low amounts of fat, sodium, and sugar, and high amounts of vitamins, minerals, and fiber. If you eat more than the amount on the label, you get more calories, fat, sodium, and other nutrients, too.
- **Look at the ingredients, too.** The first three ingredients usually make up most of the food item. Choose items with sugar, fat, and oils listed at the end of the ingredient list.
- **Check the sodium.** Foods that don't taste salty can be very high in sodium. Watch out for high amounts of sodium in deli meats, pizza, cheese, soups, breads, hot dogs, spaghetti sauce, canned foods, chips, and crackers. Choose low-sodium, no-salt or salt-free soy sauce, salsa, and seasonings as ingredients.

## ► TIPS TO MAKE MEALS AT HOME

**Make a recipe.** Prepare food at home so that you can control what goes into the meal. To find recipes that you can make at home use the What's Cooking? USDA Mixing Bowl at [WhatsCooking.fns.usda.gov](http://WhatsCooking.fns.usda.gov).

**Include foods from each of the five food groups.** Look for recipes that have more than one food group. Adding fruits, vegetables, grains, dairy, and protein foods can help you build a healthy plate. Limit foods with high amounts of solid fats, sugars, and sodium.

**Know the amount.** Use a measuring cup or spoon to measure ingredients in the recipe or the amount of food on your plate. Use recipes that list calories, sodium, and fats.

**Bake, broil, roast, or grill your foods.** Bake meats, roast vegetables, broil fish, and grill poultry instead of frying foods. You can add a lot of flavor by seasoning your foods with your favorite spices and herbs.

If you have questions about SNAP benefits or making healthy meals, ask your nutrition educator, call 1-800-221-5689, or visit the SNAP website <http://www.fns.usda.gov/snap/nutrition-education>.

**HANDOUT:**  
*HOW MUCH FOOD AND PHYSICAL ACTIVITY?*



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## ► SPANISH FRITTATA

**COOK TIME:** 30 minutes

**MAKES:** four 4-ounce servings

**INGREDIENTS:**

- 1½ pounds (about 2) russet potatoes, scrubbed
- 6 large eggs
- 2 teaspoons vegetable oil
- 1 medium yellow onion, peeled and chopped
- ½ teaspoon salt
- ¼ teaspoon black pepper

**DIRECTIONS:**

1. Preheat the oven to 400 °F.
2. Put the potatoes in a non-stick skillet on the stove and cover with cold water. Turn the heat to medium-high and cook until the potatoes are easily pierced with a knife, about 15 minutes.
3. Drain the potatoes well, remove from the skillet, and set aside to cool. Then peel and cut into 1-inch cubes.
4. Put the eggs, salt, and pepper in a bowl and mix well with a whisk.
5. Return the skillet on the stove and turn the heat to medium-high. Add the oil. Add onion and cook about 5 minutes until soft. Add the cubed potatoes.
6. Pour the egg mixture over the potatoes and onions. Press down with a spatula to make an even layer and shake gently to prevent sticking. Lower to medium heat and cook about 7 minutes.
7. Transfer the skillet to the oven and cook until the frittata is completely set, about 5 minutes.
8. Gently loosen frittata from the pan. Place a serving plate over the skillet and carefully flip the frittata onto the plate.
9. Slice into 4 wedges. Serve warm.



**NUTRIENTS PER SERVING:**

Calories 281, Protein 13 g, Dietary Fiber 5 g, Total Fat 10 g, Saturated Fat 3 g, Cholesterol 317 mg, Sodium 408 mg.



For more recipes visit  
[WhatsCooking.fns.usda.gov](http://WhatsCooking.fns.usda.gov).



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## ► FOOD AND PHYSICAL ACTIVITY CHECKLIST



- ☐ Eat foods from each food group each day.
- ☐ Use measuring cups to learn what 1 cup and ½ cup look like.
- ☐ Cut raw vegetables like broccoli and carrots into small sizes. Keep them in clear containers in the refrigerator for quick snacks.
- ☐ Broil, grill, roast, or microwave meat, poultry, or fish instead of frying.
- ☐ Visit a local farmers market to buy fruits and vegetables in season.
- ☐ Pick low-fat or fat-free milk or yogurt (Recommended for persons over 2 years of age).
- ☐ Choose whole-grain foods, such as whole-wheat bread, oatmeal, brown rice, and low-fat popcorn more often.
- ☐ Use the Nutrition Facts label to find healthier foods at the grocery store.
- ☐ Play active games like tag or jump rope with children.
- ☐ Walk with the kids to school each day.
- ☐ Take the stairs, not the elevator.
- ☐ Be physically active for at least 2½ hours per week. Take a walk or jog at lunchtime or in the evening.
- ☐ Help kids be physically active at least 60 minutes every day, or most days. They can walk, dance, bike, play ball—it all counts.

Write other ideas here:

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**HANDOUT:**  
HOW MUCH FOOD AND PHYSICAL ACTIVITY?



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## ► BRAISED CHICKEN THIGHS WITH SPINACH

**COOK TIME:** 1 hour and 10 minutes

**MAKES:** four 4-ounce servings

**INGREDIENTS:**

- 4 (6-ounce) chicken thighs, bone-in, skin removed
- 1 teaspoon oil
- ½ teaspoon salt
- ½ teaspoon black pepper
- 1 small onion, peeled, chopped
- 3 garlic cloves, peeled, minced
- ½ teaspoon dried thyme
- ½ teaspoon dried rosemary
- 1 cup water
- 1 10-ounce package frozen or 1 bunch fresh spinach



**NUTRIENTS PER SERVING:**

Calories 185, Protein 22 g, Dietary Fiber 2 g, Total Fat 8 g,  
Saturated Fat 2 g, Cholesterol 112 mg, Sodium 423 mg.

**DIRECTIONS:**

1. Heat skillet over medium-high heat. Add 1 teaspoon oil. Add chicken, top side down. Cook about 8 minutes on each side, or until deeply browned. Remove the chicken to a dinner plate and set aside.
2. Reheat skillet over medium heat. Add the onion, garlic, thyme, and rosemary. Cook about 5 minutes, until the onion is soft and golden. Return the chicken to the pan.
3. Add the water, and cover. Continue cooking for about 30 minutes.
4. Add frozen spinach and cook for about 10 minutes. Or, add the fresh spinach and cook about 2 minutes, until it wilts. Serve right away.



For more recipes visit  
[WhatsCooking.fns.usda.gov](http://WhatsCooking.fns.usda.gov).



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## ► WATCH YOUR FATS, SUGARS, AND SODIUM

Compare the solid (saturated) fats, added sugars, and sodium (salt) in the foods you eat. Look at the Nutrition Facts label to find foods with lower numbers of each.

### SOLID FATS AND OILS

Some fats are better for you than others. Oils are often better for you than solid fats. Limit solid fats such as butter, lard, stick margarine, and fats on meats and poultry. The key is to eat the right types of fats and oils in the right amounts. Oils that are better for you include:

- Canola oil
- Olive oil
- Safflower oil
- Oils in fish
- Corn oil
- Soybean oil
- Sunflower oil
- Oils in nuts and seeds

### ADDED SUGARS

Sugars add calories and are found in both food and drinks. Foods and drinks with high amounts of added sugars also have a lot of calories but little nutrition.

### SODIUM

Most of us enjoy the taste of salt in our foods. But too much sodium (salt) can lead to health problems like high blood pressure. Look for sodium on packaged foods—many of the packaged foods we eat are high in sodium.

## ► TIPS TO LOWER YOUR FATS, SUGARS, AND SODIUM

**Check the Nutrition Facts label.** Look for lower numbers in the items you buy. Pay attention to the amount of fats, sugars, and sodium.

**Cook at home so you know what goes into your food.** Prepare foods with little oil, cut back on solid fats, and choose spices instead of salt. Preparing meals at home can also cost less than eating out. 💰

**Keep an eye on the sugar.** Most of the added sugars we eat come from sodas, sports drinks, cakes, cookies, ice cream, candy, and other sweets. Focus your food dollars on vegetables, fruits, whole-grain foods, low-fat or fat-free dairy, and lean protein foods. 💰

**Add sweetness with fruit.** Top whole-grain cereal with sliced bananas, peaches, raisins, or your favorite fruit.

**Add flavor with spices, herbs, vinegars, or lemon juice.** Cut back on salt in your meals by adding no-salt seasonings, garlic, basil, apple cider vinegar, or lemon juice to your salads, meats, and side dishes. Rinse canned foods like beans or corn to lower the sodium.

**Think twice about some of your favorite foods.** Eat sweets and treats less often. They add extra calories and offer little nutrition.

💰 BUDGET-FRIENDLY TIP

HANDOUT:  
HOW MUCH FOOD AND PHYSICAL ACTIVITY?



United States  
Department  
of Agriculture

## ► PAN ROASTED TILAPIA WITH TOMATILLO SALSA

**COOK TIME:** 40 minutes

**MAKES:** four 3- to 4-ounce servings

### INGREDIENTS:

- 1 pound tomatillos
- ½ cup yellow or red onion, finely chopped
- 2 Serrano or other chilies, finely chopped
- 3 garlic cloves, minced
- 3 teaspoons vegetable oil
- ¼ teaspoon salt
- 1 tablespoon fresh lime juice (about ½ lime)
- ¼ chopped fresh cilantro leaves
- 4 tilapia fillets, patted dry with a paper towel  
(any inexpensive white fish can be used)

### DIRECTIONS:

1. Preheat the oven to 450 °F.

*To make the tomatillo salsa:*

2. To prepare the tomatillos, peel back the husk from the smooth green tomatillo skin. Rinse the tomatillos with warm water and cut into quarters.
3. Place the husked tomatillos, onion, chilies, garlic, and 1 teaspoon oil in the baking pan, stir well and transfer to the oven. Roast about 20 minutes until the tomatillos are soft and dark green. Set aside to cool.
4. Transfer the mixture to the blender; add the salt, lime juice, and cilantro and puree.

*To cook the tilapia:*

5. Place a skillet on the stove over high heat and when it is hot, carefully add 2 teaspoons of oil. Put the tilapia fillets in the pan. Cook about 2-3 minutes on each side, until golden brown on both sides.
6. Transfer the tilapia to the serving plate and top with generous amounts of salsa. Serve right away.



### NUTRIENTS PER SERVING:

Calories 171, Protein 23 g, Dietary Fiber 2 g, Total Fat 6 g,  
Saturated Fat 1 g, Cholesterol 48 mg, Sodium 195 mg.



For more recipes visit  
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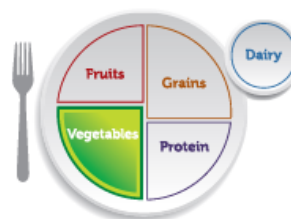
## ► CHOOSE YOUR VEGGIES

Everyone can benefit from eating more vegetables. Vegetables are full of vitamins and minerals. Find ways to add vegetables to most meals and snacks to help your family get the nutrition they need. Serve different types of vegetables like:

- Dark green—broccoli, spinach, and dark-green leafy lettuces
- Red and orange—red peppers and tomatoes; carrots and sweet potatoes
- Others—beans, peas, green beans, cauliflower, zucchini, squash, corn, and green peas

Adults and children who need 2,000 calories daily should eat about 2½ cups of vegetables each day. For 1 day, 2½ cups of vegetables might include:

- 1 cup of cooked green beans (counts as 1 cup)
- 1 cup of raw spinach (counts as ½ cup)
- One medium, baked sweet potato (counts as 1 cup)



## ► TIPS TO CHOOSE VEGGIES EVERY DAY

**Buy vegetables that can help you save money and time.** Frozen and low-sodium canned vegetables often cost less than fresh and can save time in the kitchen—no washing, slicing, or chopping. 💰

**Choose fresh vegetables when they are in season or grow your own.** When you purchase in season, vegetables are at the peak of flavor and usually cost less. You can also grow your own vegetables such as tomatoes, peas, and squash. If you receive SNAP, you can use your benefits to purchase seeds. 💰

**Set an example for your kids.** Make half your plate vegetables and fruits at meal time. Serve veggies as part of your child's meal. Offer carrot sticks or cucumber slices as a snack.

**Spice up your vegetables with herbs and seasoning.**

Cook vegetables like sliced zucchini, carrots, and onions with your favorite herbs or add a store brand seasoning for flavor. Store brand herbs and spices may cost less than name brand choices. 💰

**Serve vegetables in ways that your family will enjoy.**

Try a baked sweet potato or roasted squash. Mix broccoli and carrots with brown rice for a side dish. Place slices of tomato and lettuce in sandwiches. Add frozen vegetables to low-sodium soups.

**Keep sliced vegetables in the fridge.** Place sliced bell peppers, cauliflower, carrots, and celery in air-tight containers and store them in your refrigerator. For a quick meal, mix whole-wheat pasta with sliced and steamed bell peppers, carrots, and chickpeas.

💰 BUDGET-FRIENDLY TIP

To find the right amount of vegetables for members of your family, visit <http://choosemyplate.gov/supertracker-tools/daily-food-plans.html> or [SuperTracker.usda.gov](http://SuperTracker.usda.gov).

HANDOUT:  
VEGETABLES AND FRUITS—SIMPLE SOLUTIONS



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## ► FISH WITH SPINACH

**COOK TIME:** 30 minutes

**MAKES:** 4 servings

**INGREDIENTS:**

- 3 teaspoons vegetable oil
- 1 pound skinless cod fillets\*
- 1 yellow onion, peeled, chopped
- 2 garlic cloves, peeled, minced
- 2 cups canned tomatoes\*\*, diced, low-sodium
- ½ cup water
- 2 cups spinach, frozen, coarsely chopped
- ¼ cup black olives, pitted, chopped

**DIRECTIONS:**

1. Put the skillet on the stove over high heat. When it is hot, add 1½ teaspoons oil.
2. Add fish. Cook about 5 minutes per side, until deeply browned. Remove the fish to the plate and cover.
3. Reheat the skillet to medium heat. Add the remaining 1½ teaspoons oil, onion, and garlic. Cook about 7 minutes. Add tomatoes and water. Cook about 10 minutes, until the mixture thickens and turns from bright red to an orange color.
4. Return fish to skillet with the tomato mixture. Cover with spinach and sprinkle with olives. Cover skillet. Cook about 2 minutes over low heat until the spinach is steamed. Serve right away.

\*Try this recipe with another white fish, such as tilapia, haddock, or catfish.

\*\*Fresh tomatoes can be used instead of canned.



**NUTRIENTS PER SERVING:**

Calories 196, Protein 25 g, Dietary Fiber 6 g, Total Fat 6 g,  
Saturated Fat 1 g, Cholesterol 47 mg, Sodium 255 mg



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## ► KEEP FRUITS HANDY

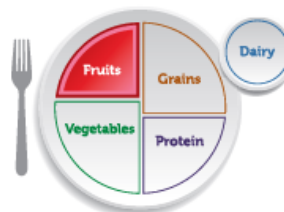
Eat a variety of fruits every day to add vitamins, minerals, and fiber to your meals and snacks. Most fruits are low in fat, sodium, and calories.

Serve different types of fruits like:

- Apples
- Bananas
- Oranges
- Canned peaches or pears packed in 100% juice
- Dried fruits such as raisins, cranberries, or prunes
- 100% orange or grapefruit juice

Adults and children who need 2,000 calories daily should eat about 2 cups of fruit each day. For 1 day, you could eat:

- **½ cup of canned peaches** (counts as ½ cup of fruit).
- **A large banana** (counts as 1 cup of fruit).
- **A small orange** (counts as ½ cup of fruit).



## ► TIPS TO KEEP FRUITS HANDY

**Put different types of fruits on your shopping list.** Look for fresh, frozen, canned, and dried fruits at the store. Purchasing canned or frozen store brand fruits can save you more. 💰

**Focus on fruit at meal time.** Slice bananas on top of 100% whole-wheat breakfast cereal, place apple slices in a peanut butter sandwich for lunch, or add canned peaches or raisins to a salad at dinner. Younger children can help you pick the fruits for family meals or snacks.

**Buy fruits in season.** While most fruits are in the grocery store all year long, some cost less when they are purchased in season. Use your SNAP benefits to buy fruits at a local farmers market. 💰

**Make fruit easy to see and eat.** Keep a bowl of fruit like apples, oranges, and bananas on the kitchen counter for quick snacks. Fill half your plate with fruits and vegetables during meals.

**Serve 100% juice.** Look at the label to check if a drink is 100% fruit juice. Offer no more than 1 cup per day to children. If kids are still thirsty, serve water or milk. Look for canned fruit packed in 100% juice such as peaches and mandarin oranges.

**Give your kids new fruits to try.** Buy cantaloupes, strawberries, watermelons, grapes, and blueberries when they are on sale. Let your child see you enjoying different kinds of fruits during meals and snacks. 💰

💰 BUDGET-FRIENDLY TIP

To find the right amount of fruits for members of your family, visit <http://choosemyplate.gov/supertracker-tools/daily-food-plans.html> or [www.supertracker.usda.gov](http://www.supertracker.usda.gov).

HANDOUT:  
VEGETABLES AND FRUITS—SIMPLE SOLUTIONS



## ► FRUIT SALAD WITH YOGURT

**TOTAL TIME:** 25 minutes

**MAKES:** four 1 cup servings

**INGREDIENTS:**

- 2 cups sliced strawberries
- 1 cup blueberries, rinsed
- 1 cup pineapple chunks, canned or fresh
- 3 tablespoons of pineapple juice\*
- 2 cups of plain, low-fat yogurt
- 2 tablespoons of sliced or slivered almonds

**DIRECTIONS:**

1. Place fruit in a large bowl and mix with pineapple juice. Let stand for 15 minutes at room temperature.
2. Place 1 cup of fruit salad in a small bowl and top with  $\frac{1}{2}$  cup of yogurt.
3. Sprinkle almonds on top of each fruit salad. Serve immediately.

\*Any 100% fruit juice can be used instead of pineapple juice.



**NUTRIENTS PER SERVING:**

Calories 172, Protein 8 g, Dietary Fiber 3 g, Total Fat 4 g, Saturated Fat 1 g, Cholesterol 7 mg, Sodium 88 mg.



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## ► WHAT COUNTS AS 1 CUP?

Each food shown below counts as 1 cup of fruit or vegetables.

### ► FRUITS

Many people need to eat 2 cups from the fruits group each day.\*



1 cup of chopped fruit like fruit cocktail counts as 1 cup



1/2 cup of dried fruit like raisins counts as 1 cup



1 large banana counts as 1 cup



32 red seedless grapes count as 1 cup



1 cup (8 ounces) of 100% fruit juice counts as 1 cup

### ► VEGETABLES

Many people need to eat 2 1/2 cups from the vegetables group each day.\*



2 cups of leafy greens like raw spinach counts as 1 cup



1 large sweet potato counts as 1 cup



12 baby carrots count as 1 cup



1 cup of cooked black beans counts as 1 cup



1 cup of cooked vegetables like green beans counts as 1 cup

\*The amounts are for a person on a 2,000-calorie daily food plan. The amount of fruits and vegetables may vary depending on the age, gender, and physical activity level of each person.

To find the right amount of fruits and vegetables for members of your family, visit <http://choosemyplate.gov/supertracker-tools/daily-food-plans.html> or [SuperTracker.usda.gov](http://SuperTracker.usda.gov).

**HANDOUT:**  
*VEGETABLES AND FRUITS—SIMPLE SOLUTIONS*



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## ► CUBAN SALAD

**TOTAL TIME:** 20 minutes

**MAKES:** four 1-cup servings

**INGREDIENTS:**

*For the dressing:*

- 3 tablespoons vegetable oil
- ¼ cup fresh lime juice (1 large or 2 small limes)
- 1 teaspoon of garlic, peeled and minced
- ¼ teaspoon salt
- ¼ teaspoon black pepper

*For the salad:*

- 1 head romaine lettuce, washed, patted dry with paper towels, and torn into bite-size pieces
- 2 large tomatoes, diced
- 1 red onion, finely diced
- 6-8 radishes, thinly sliced

**DIRECTIONS:**

*To make the dressing:*

1. Put the oil, lime juice, garlic, salt, and pepper in the small bowl and mix well. Lemon juice can be used instead of lime juice.

*To make the salad:*

2. Put the lettuce, tomatoes, onion, and radishes in the mixing bowl and toss to combine. White onion can be used instead of red onion.
3. Pour the dressing over the lettuce mixture and toss. Serve right away.
4. For protein, add low-sodium canned tuna, sardines, or salmon on top of the salad.



**NUTRIENTS PER SERVING:**  
Calories 154, Protein 3 g, Dietary Fiber 7 g, Total Fat 11 g,  
Saturated Fat 1 g, Cholesterol 0 mg, Sodium 194 mg.



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## Appendix C.

### Dietitian Recruitment Flyer

A recruitment flyer for dietitians. The background is a grayscale photograph of a woman looking down at a child who is eating. A large yellow box with the text "DIETITIANS NEEDED !!!" is overlaid on the image. Below this, there are two columns of text: "WE NEED HELP WITH" and "BENEFITS FOR YOU". At the bottom, there is contact information for Pasua Chang and a deadline of February 24, 2024.

**DIETITIANS NEEDED !!!**

**WE NEED HELP WITH**

- Virtual nutrition education
- Childhood obesity prevention
- Promoting healthy eating habits

*\*If interested, send your CV to [changps@mtmary.edu](mailto:changps@mtmary.edu)*

**Questions?**  
Contact Pasua Chang  
[changps@mtmary.edu](mailto:changps@mtmary.edu)  
Mount Mary University

**BENEFITS FOR YOU**

- Name inclusion if research gets published
- Research experience to add to your portfolio
- Developing relations with low-income families in need of nutrition guidance

**Deadline**  
February 24, 2024

## Appendix D.

### Consent Form



### Research Participant Information and Consent Form

#### Mount Mary University

**Title of Study:** Do Annual Nutrition Education Reinforcement Sessions Reduce Childhood Obesity: A Randomized Controlled Trial

**Invitation to Participate and Purpose of the Research:** You are invited to participate in a research study that seeks to determine the effects of annual nutrition education reinforcement sessions for mothers on the reduction of overweight or obese children's BMI-for-age z-scores and weekly intake of fruits and vegetables outside of school meals. Participants will be asked to complete a baseline survey and to attend four discussions that supports obesity prevention efforts over a period of four weeks. After completion of the four-week program, participants will be randomized and split into two groups. One group will receive the intervention and the other group will not receive the intervention. All participants will receive nutrition education handouts consisting of tips and/or recipes every three months after the completion of the program for the duration of this study. All participants are expected to schedule annual well-child visits for their child who is involved in this study. After completing their child's well-child visit, participants in the intervention group will receive one-on-one virtual annual nutrition education reinforcement sessions with an assigned dietitian. The dietitians will discuss topics from the four-week discussion program and provide tips on applying strategies that the participant needs more support with. Participants in the control group will not

receive these sessions. Data collected from the participant and her child will consist of demographic and socioeconomic data, education level, and child's gender, age, weight, and height. After the four-week discussion program, dietitians will collect data from participants in the intervention group and a research assistant will contact participants in the control group to collect their data. Both dietitians and research assistants will collect children's age, height, and weight from the child's electronic health record after the participant's child attends their annual well-child visit. Data will be de-identified and analyzed by researchers.

**Benefits and Risks:** This research is designed to benefit the dietetics profession, by providing support for parents with overweight/obese children to meet annually with dietitians in an effort to reduce the prevalence of childhood obesity. This study will also benefit parents by providing tips and strategies to support a healthy lifestyle, which may benefit their family's overall health. There will be no monetary compensation; however, participants who complete the four-week discussion program will receive a Hunger Task Force colander and 2-in-1 vegetable peeler and brush. There are no known potential risks associated with participating in this study. Please address any questions or issues of concern to the researchers using the contact information provided below.

**Confidentiality:** All information obtained will be kept confidential by the researchers who will be the only people with access to the data. Information obtained will be stored electronically and will be password protected. Per the U.S. Office of Human Research Protections (code §46.115), all data will be destroyed 3 years after the end of data collection. Paper files will be shredded, and electronic files will be deleted. Individual participants will not be identified in any report or publication about this study.

**Contact Information:** If you have questions about this research study, your rights as a research subject, or would like to know the outcome of the research, please contact Janine Bamberger, 414-930-3264,

[bambergj@mtmary.edu](mailto:bambergj@mtmary.edu) and Pasua Chang, 414-252-9347, [changps@mtmary.edu](mailto:changps@mtmary.edu). If you have any questions regarding your rights or privacy as a participant in this study, please contact Dr. Tammy Scheidegger, Mount Mary University Institutional Review Board Chair, 2900 North Menomonee River Parkway, Milwaukee, Wisconsin, 53222-4597, telephone (414) 930-3434 or email [scheidet@mtmary.edu](mailto:scheidet@mtmary.edu).

**Consent:** By signing below, you are indicating that you have read this consent form, have been given the opportunity to ask questions, and have agreed to voluntarily participate. You may withdraw from participation at any time, or refuse to answer any question herein, without penalty or loss of benefits to which other participants are entitled.

You may request a copy of this page for your records. Thank you for your participation.

Signature of participant \_\_\_\_\_ Date \_\_\_\_\_

Participant phone number \_\_\_\_\_

Participant email \_\_\_\_\_

## Appendix E.

### Assent Form



### Research Participant Information and Assent Form

#### Mount Mary University

**Title of Study:** Do Annual Nutrition Education Reinforcement Sessions Reduce Childhood Obesity: A Randomized Controlled Trial

**Invitation to Participate and Purpose of the Research:** Research studies help us learn new things. We can test new ideas. We ask a question and then try to find the answer in research studies. You are invited to participate in a research study that helps us see what happens if your mom meets with a dietitian once a year. We want to see how your mom meeting a dietitian will affect your weight and how much fruits and vegetables you eat every week outside of school. Your mom will be part of a four-week program that teaches her and other moms how to plan meals and add fruits and vegetables. You and your mom will be randomly put into one of two groups. Randomly means that we don't know which group you and your mom will end up in until after you both are put in the group. One group will meet with a dietitian every year and the other group will not. After your mom does the four-week program, dietitians and our research helpers will collect data from about your age, height and weight.

**How will this research help me?** This research will help teach your mom how to keep you healthy. Please address any questions or issues of concern to the researchers using the contact information provided below.

**Confidentiality:** All information obtained will be kept confidential by the researchers who will be the only people with access to the data. Information obtained will be stored electronically and will be password protected. Per the U.S. Office of Human Research Protections (code §46.115), all data will be destroyed 3 years after the end of data collection. Paper files will be shredded, and electronic files will be deleted. Individual participants will not be identified in any report or publication about this study.

**Contact Information:** If you have questions about this research study, your rights as a research subject, or would like to know the outcome of the research, please contact Janine Bamberger, 414-930-3264, [bambergj@mtmary.edu](mailto:bambergj@mtmary.edu) and Pasua Chang, 414-252-9347, [changps@mtmary.edu](mailto:changps@mtmary.edu). If you have any questions regarding your rights or privacy as a participant in this study, please contact Dr. Tammy Scheidegger, Mount Mary University Institutional Review Board Chair, 2900 North Menomonee River Parkway, Milwaukee, Wisconsin, 53222-4597, telephone (414) 930-3434 or email [scheidet@mtmary.edu](mailto:scheidet@mtmary.edu).

**Assent:** Signing below means that you have read this assent form, have been given the opportunity to ask questions, and have agreed to voluntarily participate. You may withdraw from participation at any time, or refuse to answer any question herein, without penalty or loss of benefits to which other participants are entitled.

Your mom will receive a copy of this page for your records. Thank you for your participation.

Signature of participant \_\_\_\_\_ Date \_\_\_\_\_

## Appendix F.

### Demographic and Baseline Questionnaire

#### Demographic information:

1. What is your age?
  - a. 18-25 years old
  - b. 26-31 years old
  - c. 32-40 years old
  - d. 41+ years old
2. What gender is your child?
  - a. Boy
  - b. Girl
3. What is your race-ethnicity?
  - a. Non-Hispanic White
  - b. Non-Hispanic Black
  - c. Hispanic
  - d. Asian
  - e. American Indian
  - f. Other
4. What is your highest education level?
  - a. Less than high school
  - b. High school
  - c. Some college
  - d. College Education

#### Baseline anthropometric information:

1. What is your child's birth date? \_\_\_\_\_
2. How much does your child weigh? \_\_\_\_\_
3. How tall is your child? \_\_\_\_\_

#### Baseline fruits and vegetable intake:

1. One serving of fruits and vegetables is about  $\frac{1}{2}$  cup. How many servings of fruits and vegetables (combined) does your child eat in an average week outside of school meal programs?

## Appendix G.

### Annual Nutrition Education Reinforcement Session:

#### Dietetic Counseling Guidance Tool

This document serves as a guide for dietitians participating in the Nutrition Education Reinforcement Sessions for Childhood Obesity Prevention. Dietitians should reference this document when meeting clients who are part of this study.

Annual nutrition education reinforcement sessions serve as annual meetings that will allow parents to receive guidance on applying strategies and techniques taught in the *MyPlate for My Family* program. Your role as a dietitian is to refresh parents' memories and remind them about topics that they learned in the previously mentioned program as well as provide parents the counseling and guidance they need to keep developing healthy diet behaviors.

#### Reinforcement Sessions:

At the start of each annual nutrition reinforcement session, you will build rapport with the patient. After building rapport, ask the patient about their child's average fruit and vegetable intake at home on a weekly basis. Please record the patient's response in the Data Collection Form. This may look like saying:

“Before we go deeper into the session, I wanted to ask how many servings of fruits and vegetables (combined) does your child eat in an average week outside of school meal programs? As a reminder, one serving of fruits and vegetables is about ½ cup.”

Use motivational interviewing to remind patients about the topics that they learned in the *MyPlate for My Family* curriculum. This may look like saying:

“It is my understanding that you previously participated in the *MyPlate for My Family* curriculum at the Hunger Task Force. Is that correct? What do you remember about that program?”

Or, if this is the second or third year that you are meeting the patient, you may say:

“What do you remember about *MyPlate for My Family*?”

Let the patient guide you on topics that they remember and ask them if:

- They have had any success in applying any of the topics that were taught to them.
- There are any topics that they would like more support on applying into their daily lives.

If a patient does not remember, ask them if it is okay to remind them what the topics were or let them know if they ask. Here are the topics that were discussed in the *MyPlate for My Family* program:

- Session 1: MyPlate Family Meals
  - Planning quick, tasty, affordable meals
  - Shopping for low-cost foods in all food groups
  - Saving time when cooking meals
  - Involving children in making meals
- Session 2: How Much Food and Physical Activity?
  - Amount and types of foods your family needs each day.
  - Tips to prepare healthy meals with foods from each food group.
  - Connection between amount of food eaten and physical activity.
- Session 3: Vegetables and fruits
  - Types and amounts of vegetables and fruits needed.
  - Easy and low-cost fruits and vegetables.
  - Ways to help children eat fruits and vegetables.
- Session 4: Family time active and fun
  - Planning easy and low-cost ways to be physically active
  - Including children in physical activity daily

*Tip:* It may be helpful to provide the list to the patient and allow them to look it over.

After reviewing the list of topics, ask the client what topics they would like to go over during the meeting. Create an agenda with the client and confirm with them that it is accurate according to what they want to discuss.

Once the agenda is confirmed, use the “Chunk-Check-Chunk” method to go through each point on the agenda. This strategy will help avoid overloading information while increasing comprehension.

#### After The Session:

After you meet with the patient, please complete the password encrypted data collection form provided to you. You will need the following information: the date of the session, child’s height (meters), weight (kilograms), and age (months). You will need to obtain the child’s anthropometric measurements from their electronic health record. This is also where you will record how many servings of fruits and vegetables your patient’s child ate on average per week outside of school meals. Please keep this document on a private flash drive, locked and stored in a safe location when not in use. When you have met with all 20 of your assigned patients for the year and completed the data collection form, please send an encrypted email to the lead

researcher with your password encrypted data collection form attached. A new password encrypted document will be securely sent to you for the next year.

## Appendix H.

### Data Collection Form:

Patient name:	Date of meeting with patient	Child's age (months):	Weight (kg):	Height (m):	Average number of servings of fruits and vegetables (combined) consumed by child outside of school meals:
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18.					
19.					
20.					

## Appendix I.

Rice Lake RL-MPS-50 Mechanical Physician Scale with Height Rod

Model #: T9FB2381071



## Appendix J.



**Mount Mary University  
Institutional Review Board (IRB)  
for the Protection of Human Subjects**

Application for IRB Review

**DATA COLLECTION CANNOT BEGIN  
UNTIL THE IRB HAS APPROVED THIS PROJECT**

**Directions:**

- Faculty and student researchers, as well as student research advisors, should **read all relevant information on the University IRB page in My Mount Mary before initiating an application**. This includes full knowledge of the US Department of Health and Human Services Code of Federal Regulations Title 45 (Public Welfare), Part 46 (Protection of Human Subjects). <http://www.hhs.gov/ohrp/humansubjects/guidance/45cfr46.html>.
- All applicants must verify completion of Human Subjects Training. See <http://www.citiprogram.org>.
- The IRB application must be filed and approved by the IRB prior to any Mount Mary University faculty, staff, or student (undergraduate or graduate), initiating a research project/study.
- If there is a cooperating institution, attach a copy of their IRB approval.
- In the case of a student research project, the student may complete the IRB application but the student's research advisor must sign and submit the application to the IRB for approval. It is the responsibility of the faculty research advisor to ensure that student applications and all attachments (e.g., informed consent forms and survey instruments) are in their final edited form. Even though a student research project may qualify as exempt from full IRB review, the research advisor may request the student to complete and submit a full IRB application.
- Complete this application using your word processing program (e.g. Word), then send it on or print it out and obtain signatures from all investigators and advisors. (Handwritten applications will not be accepted.) For your benefit, save the completed application on your computer in case it needs to be revised and resubmitted.
- This is a professional document; please check spelling, grammar and punctuation.

- Submit an electronic copy, via email, of the completed application with required signatures and attachments, in a single pdf, to Tammy Scheidegger, IRB Chair, [scheidet@mtmary.edu](mailto:scheidet@mtmary.edu). You will receive an email verifying receipt of the application.
- Allow a minimum of 30 working days to process your application. Make sure this timeframe is accounted for when considering initiation of data collection and due dates for student projects. Please be aware that if, upon completion of the application, you find that no exemptions apply to your research, your application will need to go through a full IRB Committee review which can take as many as 60 days to be completed.
- For class projects you must submit IRB applications to the IRB Chair by October 31st of the fall semester and March 31st for the spring semester. For summer classes, please consult with the IRB Chair.
- Upon receipt of the IRB letter of approval, data collection may begin.

**I. Required Documentation - *No action will be taken without these attachments.***

Are the following attached to the IRB application?

Informed Consent Document	<input checked="" type="checkbox"/> Yes    Informed Consent Documents should include an explanation of procedures, risk, safeguards, freedom to withdraw, confidentiality, offer to answer inquiries, third party referral for concerns, signature and date. See Appendix A and use the <b>MMU Informed Consent Template to avoid delays in the process.</b>
Survey/Interview Instrument(s)	<input checked="" type="checkbox"/> Yes    If a survey is being administered in any written format (e.g., Google Forms, Survey Monkey, Qualtrics), a copy of that survey must accompany this application. If a survey/interview is being conducted verbally, a copy of the introductory protocol/comments and survey questions being asked must be attached to this application. If survey/interview includes focus group questions, a complete list of the question must be attached. For research using a published/purchased instrument, a photocopy of the instrument will suffice.
Verification of Human Subjects Training	<input type="checkbox"/> Yes    Copy of transcript, certificate or other evidence that ALL members of the research team have completed the required training.
Copy of cooperating institution's IRB approval.	<input type="checkbox"/> Yes    Not required if there is no cooperating institution.

**II. Investigator(s):**

Name: Pasua ChangPhone: 414-252-9347Affiliation with Mount Mary University (e.g. faculty, student, etc.): StudentEmail: changps@mtmary.eduSignature: Pasua ChangDate: 4/30/2023

Name: \_\_\_\_\_

Phone: \_\_\_\_\_

Affiliation with Mount Mary University: \_\_\_\_\_

Email: \_\_\_\_\_

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

**If student, list Research Advisor and complete the application. Research Advisor must provide requested information and verify.**Research Advisor's Name: Janine Bamberger Department: DieteticsEmail: bambergj@mtmary.edu Phone: 414-930-3264Research Advisor: Have you completed Human Subject's Training? ☒ Yes ☐ No**Research advisor's signature indicates responsibility for student compliance with all IRB requirements.**

Signature: \_\_\_\_\_

Date: 4/30/2023

Research Advisor

**Individuals who participate in research play an important and active role in the advancement of knowledge. In recognition of their important contributions to research, humans will be referred to as "participants" rather than "subjects."****III. Project Description** – Required by all applicants**Instructions:** Briefly describe the proposed project including the sample and methodology (e.g. human subjects, data collection, data analysis and instruments).

- 1) Objectives (purpose of project):

To determine the effects of annual nutrition education reinforcement sessions on the reduction of overweight/obese children's BMI-for-age z-scores and these children's average consumption of fruits and vegetables outside of school meals on a weekly basis.

2) Relevance to practice/body of knowledge:

This study will either provide support for or against the need for annual reinforcement of healthy eating for parents to help decrease childhood obesity.

3) Describe the research design (e.g. subject/participant selection and assignment, design, intervention, data analysis:

4) What measurement/data collection tools are being used?

#### IV. Additional Project Information

1) What human subjects training has the researcher completed (e.g. course work, online certification)?

Basic Human Subjects – Social & Behavioral Focus completed by Pasua Chang and Janine Bamberger

2) What process is used for obtaining informed consent? See Appendix A for consent content requirements and use the template, available on the MMU IRB webpage, when constructing your informed consent form.

Prior to inviting mothers to the *MyPlate for My Family* program classes, they will be given a consent form to sign by their WIC nutritionist.

3) Does the research include special populations?

- |  |   |  |
|--|---|--|
| • Minors under 18 years of age?            | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No            |
| • Persons legally incompetent?             | <input type="checkbox"/> Yes            | <input checked="" type="checkbox"/> No |
| • Prisoners?                               | <input type="checkbox"/> Yes            | <input checked="" type="checkbox"/> No |
| • Pregnant women, if affected by research? | <input type="checkbox"/> Yes            | <input checked="" type="checkbox"/> No |
| • Persons institutionalized?               | <input type="checkbox"/> Yes            | <input checked="" type="checkbox"/> No |
| • Persons mentally incapacitated?          | <input type="checkbox"/> Yes            | <input checked="" type="checkbox"/> No |

***If YES, describe additional precautions included in the research procedures.***

Parental consent will be required in order to obtain any data on children. Additionally, an assent form will be available if parents choose to utilize it for their children.

4) Does the research involve any of the following procedures?

- False or misleading information to subjects? ☐ Yes ☒ No
- Withholds information such that their informed consent might be questioned? ☐ Yes ☒ No
- Uses procedures designed to modify the thinking, attitudes, feelings, or other aspects of the behavior of the subjects? ☒ Yes ☐ No

***If YES, describe the rationale for using procedures, how the human subjects will be protected and what debriefing procedures are used.***

Motivational interviewing will be used to encourage participants to make nutrition related goals during annual nutrition education reinforcement sessions. Participants will maintain authority over their actions as dietitians only act as coaches. Additionally, participants will be informed that they may quit participating in the research at any time.

5) Does the research involve measurement in any of the following areas?

- Sexual behaviors? ☐ Yes ☒ No
- Drug use? ☐ Yes ☒ No
- Illegal conduct? ☐ Yes ☒ No
- Use of alcohol? ☐ Yes ☒ No

***If YES, describe additional precautions included in the research procedures.***

6) Are any portions of the research being conducted online?

- Survey posted on a website? ☐ Yes ☒ No
- URL for survey includes information that could identify participants? ☐ Yes ☒ No
- Invitation to participate sent by email? ☒ Yes ☐ No
- Items use drop-down box? ☐ Yes ☒ No
- If yes, assure that items allow choice of “no response”
- Will you be recording virtual interviews? ☐ Yes ☒ No

☐ Audio only   ☐ Video only   ☐ Audio & Video

If video recording is being used, assure anonymity by only recording audio unless the research necessitates visual recording.

***If YES, to any of the above items, describe additional procedures.***

Dietitians will be recruited to participate in this study via email. The Advocate Aurora Health Research Institute will send out emails with recruitment flyers. Flyers will have the investigator's contact information on it and dietitians who are interested in helping with the study should send their curriculum vitae to the investigator. Participants who are mothers will be recruited in person at their WIC clinics.

7) Describe the methods used to ensure confidentiality of data obtained.

Data obtained will be kept confidential by the dietitians and research assistants collecting the information by deleting names of participants prior to submission of their data collection forms. Additionally, data from this study will be kept private through password encrypted computer-based files and will only be accessible to study personnel. Paper documents, such as informed consent forms and pre-surveys, will be stored in a locked filing cabinet at the Hunger Task Force. All data collection forms will be password encrypted documents, meant to be filled on a computer and by a dietitian or research assistant who has the password to the document. Every year after a dietitian has met with their 20 assigned patients, they will delete the names of their participants and then send their password encrypted document to the lead researcher via an encrypted email. Completed data collection forms will be stored as password encrypted documents on a private flash drive and locked in a filing cabinet with the informed consent forms, assent forms, and pre-surveys at the Hunger Task Force.

### **Risks and Benefits**

1) Describe risks to the subjects and the precautions that will be taken to minimize them. (Risk includes any potential or actual physical risk of discomfort, harassment, invasion of privacy, risk of physical activity, risk to dignity and self-respect, and psychological, emotional or behavioral risk.)

There are no known potential risks associated with participating in this study.

2) Describe the benefits to subjects and/or society. (These will be balanced against risk.)

This research will provide support for parents with overweight/obese children to meet annually with dietitians in an effort to reduce the prevalence of childhood obesity. This research study will also benefit parents by providing professional support in applying tips and strategies to support a healthy lifestyle, which may benefit their family's overall health and reduce the risk of chronic diseases.

### V. Is the proposed project “research” as defined by Institutional Review Board requirements?

Per 45 CFR 46.102: “Research is defined as a systematic investigation, including research development, testing, and evaluation, designed to develop or contribute to generalizable knowledge. Activities that meet this definition constitute research for purposes of this policy, whether or not they are conducted or supported under a program that is considered research for other purposes.”

Per HHS.gov and the Office for Human Subjects Research

(<https://www.hhs.gov/ohrp/regulations-and-policy/requests-for-comments/draft-guidance-activities-deemed-not-be-research-public-healthsurveillance/index.html#:~:text=For%20purposes%20of%20the%202018,by%20a%20public%20health%20authority>), the following activities are deemed **not** to be research:

- Scholarly and journalistic activities (e.g., oral history, journalism, biography, literary criticism, legal research, and historical scholarship), including the collection and use of information, that focus directly on the specific individuals about whom the information is collected.
- Public health surveillance activities, including the collection and testing of information or biospecimens, conducted, supported, requested, ordered, required, or authorized by a public health authority. Such activities are limited to those necessary to allow a public health authority to identify, monitor, assess, or investigate potential public health signals, onsets of disease outbreaks, or conditions of public health importance (including trends, signals, risk factors, patterns in diseases, or increases in injuries from using consumer products). Such activities include those associated with providing timely situational awareness and priority setting during the course of an event or crisis that threatens public health (including natural or man-made disasters).
- Collection and analysis of information, biospecimens, or records by or for a criminal justice agency for activities authorized by law or court order solely for criminal justice or criminal investigative purposes.
- Authorized operational activities (as determined by each agency) in support of intelligence, homeland security, defense, or other national security missions.

A human subject is defined as a living individual about whom an investigator obtains either 1) data through intervention or interaction with the individual; or 2) identifiable private information. In social science research, human subjects may be referred to as research subjects or research participants.

Does the research involve human subjects/participants or official records about human subjects/participants?

☒ Yes   ☐ No

***If “no”, STOP here, and submit application.***

If the results will be available in the library, presented at a professional conference (includes any presentation to group(s) outside of the classroom), or published, please check the Yes box:

☐ Yes   ☒ No

*If “yes”, proceed to SECTION VI.  
If “no, STOP here, and submit application.*

## **VI. Exemptions - Required by all applicants**

Are you requesting exemption from IRB review in one of the federally approved categories?

☐ Yes ☐ No

*If yes, please reference OHRP website*

*<http://www.hhs.gov/ohrp/humansubjects/guidance/45cfr46.html> and continue with application.*

- 1) Does the research meet the criteria for exempt category 1 (education)? [45 CFR 46.104(d)(1)]? Is the research conducted in established or commonly accepted educational settings (e.g. schools, Universities, or other sites where educational activities regularly occur)?

☐ Yes ☐ No

Does the research study involve only normal education practices that are not likely to adversely impact students’ opportunity to learn required educational content or the assessment of educators who provide instruction? This includes most research on regular and special education instructional strategies, and research on the effectiveness of or the comparison among instructional techniques, curricula, or classroom management methods.

☐ Yes ☐ No

*If both questions are answered “yes”, stop here, and submit application.*

- 2) Does the research meet the criteria for exempt category 2 (specific procedures) [45 CFR 46.104(d)(2)]? Does the research involve only the use of educational tests, survey procedures, interview procedures or observation of public behavior (including visual or auditory recording)?

☐ Yes ☐ No

Does this research meet at least one of the following criteria:

- The information obtained is recorded by the investigator in such a manner that the identity of the human subjects cannot readily be ascertained, directly or through identifiers linked to the subjects

☐ Yes ☐ No

- Any disclosure of the human subjects' responses outside the research would not reasonably place the subjects at risk of criminal or civil liability or be damaging to the subjects' financial standing, employability, educational advancement, or reputation.

☐ Yes ☐ No

***If the primary question and either of the two sub-questions are answered "yes", stop here, and submit the application.***

- 3) Does the research meet the criteria for exempt category 3 [45 CFR 46.104(d)(3)]? Does the research involve benign behavioral interventions in conjunction with the collection of information from an adult subject through verbal or written responses (including data entry) or audiovisual recording and prospectively agrees to the intervention and information collection and at least one of the following criteria is met:

- The information obtained is recorded by the investigator in such a manner that the identity of the human subjects cannot readily be ascertained, directly or through identifiers linked to the subjects

☐ Yes ☐ No

- Any disclosure of the human subjects' responses outside the research would not reasonably place the subjects at risk of criminal or civil liability or be damaging to the subjects' financial standing, employability, educational advancement, or reputation

☐ Yes ☐ No

- The information obtained is recorded by the investigator in such a manner that the identity of the human subjects can readily be ascertained, directly or through identifiers linked to the subjects

☐ Yes ☐ No

*For the purpose of this provision, benign behavioral interventions are brief in duration, harmless, painless, not physically invasive, not likely to have a significant adverse lasting impact on the subjects, and the investigator has no reason to think the subjects will find the interventions offensive or embarrassing. Provided all such criteria are met, examples of such benign behavioral interventions would include having the subjects play an online game, having them solve puzzles under various noise conditions, or having them decide how to allocate a nominal amount of received cash between themselves and someone else.*

*If the research involves deceiving the subjects regarding the nature or purposes of the research, this exemption is not applicable unless the subject authorizes the deception through a prospective agreement to participate in research in circumstances in which the subject is informed that he or she will be unaware of or misled regarding the nature or purposes of the research.*

***If the answer to this question is “yes”, stop here, and submit application.***

- 4) Does the research meet the criteria for exempt category 4 (existing data/specimens) [45 CFR 46.104(d)(4)]? Does this research use secondary data (i.e., *secondary research/data uses consists of identifiable private information or identifiable biospecimens, if at least one of the following criteria is met: (i) The identifiable private information or identifiable biospecimens are publicly available; (ii) Information, which may include information about biospecimens, is recorded by the investigator in such a manner that the identity of the human subjects cannot readily be ascertained directly or through identifiers linked to the subjects, the investigator does not contact the subjects, and the investigator will not re-identify subjects; (iii) The research involves only information collection and analysis involving the investigator’s use of identifiable health information when that use is regulated under 45 CFR parts 160 and 164, subparts A and E, for the purposes of “health care operations” or “research” as those terms are defined at 45 CFR 164.501 or for “public health activities and purposes” as described under 45 CFR 164.512(b); or (iv) The research is conducted by, or on behalf of, a Federal department or agency using government-generated or government-collected information obtained for non-research activities, if the research generates identifiable private information that is or will be maintained on information technology that is subject to and in compliance with section 208(b) of the E-Government Act of 2002, 44 U.S.C. 3501 note, if all of the identifiable private information collected, used, or generated as part of the activity will be maintained in systems of records subject to the Privacy Act of 1974, 5 U.S.C. 552a, and, if applicable, the information used in the research was collected subject to the Paperwork Reduction Act of 1995, 44 U.S.C. 3501 et seq.) for which consent is not required?*

☐ Yes ☐ No

Does the research involve only the collection or study of existing data, documents, records, pathological specimens, or diagnostic specimens?

☐ Yes ☐ No

Will the information be recorded by the investigator in such a manner that the subjects cannot be identified directly or through identifiers linked to the subjects? (See Appendix B)

☐ Yes ☐ No

***If all answers are “yes”, stop here, and submit application.***

- 5) Does the research meet the criteria for exempt category 5 (federal program research) [45 CFR 46.104(d)(5)]? Is this research or a demonstration project that is conducted or supported by a Federal department or agency, or otherwise subject to the approval of department or agency heads (or the approval of the heads of bureaus or other subordinate agencies that have been delegated authority to conduct the research and demonstration

projects), and that are designed to study, evaluate, improve, or otherwise examine public benefit or service programs, including procedures for obtaining benefits or services under those programs, possible changes in or alternatives to those programs or procedures, or possible changes in methods or levels of payment for benefits or services under those programs (i.e., such projects include, but are not limited to, internal studies by Federal employees, and studies under contracts or consulting arrangements, cooperative agreements, or grants. Exempt projects also include waivers of otherwise mandatory requirements using authorities such as sections 1115 and 1115A of the Social Security Act, as amended)?

☐ Yes ☐ No

Does the research involve studying, evaluating or examining federal public benefit or service programs?

☐ Yes ☐ No

Is the research conducted through a federal agency?

☐ Yes ☐ No

***If all of the answers are “yes”, stop here, and submit application.***

- 6) Does the research meet the criteria for exempt category 6 (taste and food quality) [45 CFR 46.104(d)(6)]?

Does the research involve a taste and food quality evaluation or consumer acceptance study?

☐ Yes ☐ No

Does the wholesome food consumed contain no additives, or a food ingredient at or below the level and for a use found to be safe, or agricultural chemical or environmental contaminant at or below the level found to be safe, by the Food and Drug Administration or approved by the Environmental Protection Agency or the Food Safety and Inspection Service of the U.S. Department of Agriculture?

☐ Yes ☐ No

***If all of the answered are “yes”, stop here, submit application.***

- 7) Does the research meet the criteria for exempt category 7 (Storage or maintenance for secondary research for which broad consent is required) [45 CFR 46.104(d)(7)]? Does the research involve the storage of secondary research data for which broad consent is required (contains identifiable private information or identifiable biospecimens for potential secondary research)?

☐ Yes ☐ No

- 8) Does the research meet the criteria for exempt category 8 (Secondary research for which broad consent is required) [45 CFR 46.104 (d) (8)]? Does the research involve the use of identifiable private information or identifiable biospecimens for secondary research use?

☐ Yes ☐ No

Are **all** of the following criteria met: (i) Broad consent for the storage, maintenance, and secondary research use of the identifiable private information or identifiable biospecimens will be obtained; (ii) Documentation of informed consent or waiver of documentation of consent will be obtained; (iii) the research to be conducted is within the scope of the broad consent referenced in paragraph (i) of this section; and (iv) the investigator will not include returning individual research results to subjects as part of the study plan. This provision does not prevent an investigator from abiding by any legal requirements to return individual research results.

☐ Yes ☐ No

**If no exemptions apply, your application will need to go through a full IRB Committee review. Be advised that this process can take as many as 60 days to be completed.**