Perceptions of key informants regarding the educational needs of the Supplemental Nutrition Assistance Program Education (SNAP-Ed) target audience

A thesis submitted in partial fulfillment of the requirements for the degree of Master of Science in Nutrition

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August, 2017
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Entitled

Perceptions Of Key Informants Regarding The Educational Needs Of The Supplemental Nutrition Assistance Program Education (Snap-Ed) Target Audience

be accepted in partial fulfillment of the requirements for the degree of

MASTER OF SCIENCE

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August, 2017
Abstract

The purpose of this thesis study was to describe the perceptions of key informants regarding the nutrition and physical activity needs of SNAP participants and others residing in low-income communities. Professionals in Nevada with knowledge of or experience with SNAP households and others residing in low-income communities acted as key informants. Qualitative methods were employed to obtain in-depth information regarding the perceptions of key informants in regard to the needs of the SNAP-Ed target audience. This information will be used to prioritize SNAP-Ed program objectives. Semi-structured telephone interviews were conducted and audio recorded. The key informants included 35 professionals living in Nevada. The audio recordings were transcribed verbatim and responses to questions were coded into categories. Key informants rated Nevada SNAP-Ed target audience’s need for education on six topics using a five-point scale. Mean ratings were as follows: healthy eating = 4.5 ± 0.7, healthful shopping = 4.4 ± 0.7, food resource management = 4.2 ± 0.9, food safety = 3.5 ± 1.1, physical activity = 4.0 ± 0.8, sedentary behavior = 4.2 ± 0.8. Common themes were present in the interview data. Key informants communicated that healthy eating, healthful shopping, and food resource management are all related and it is difficult to disentangle the topics. Key informants also reported the importance of educating on cooking at home. Throughout the interviews, informants mentioned the value of coordination with other organizations. Informants reported that environmental barriers make it difficult for Nevadans to lead a healthy lifestyle. In response to a questions about what group in Nevada has the highest need for education on nutrition and physical
activity, those with limited resources or low socioeconomic status were most commonly mentioned. Finally, the key informants communicated enthusiasm regarding policy, system, and environmental interventions and were eager to help make the healthy choice the easy choice for the SNAP-Ed audience. This study gathered valuable information regarding the perceptions of key informants regarding the needs of the SNAP-Ed target audience that will be useful for informing future SNAP-Ed programming. In addition, these results provided information on potential methods to make it easier for SNAP households and others residing in low-income community to choose healthful foods and be physically active more often.
Acknowledgements

First, I would like to thank my advisor, Dr. Jamie Benedict, for her endless guidance, support, and patience during my graduate school work. I feel so fortunate to have had the opportunity to work and learn under her direction. I would also like to thank my committee members, Dr. Stanley Omaye and Dr. Veronica Dahir, for their valuable input and support during my graduate work.

I also want to thank my supportive friends and family for their encouragement throughout this journey. To my fiancé, Zach, thank you for your love and support throughout this process and always encouraging me to follow my dreams.

I would like to thank all of the key informants in Nevada who participated in my research study. This study was funded by the USDA’s Supplemental Nutrition Assistance Program- SNAP.
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Chapter 1

Introduction to Thesis

This thesis will begin with an introduction and overview of the study. In Chapter 2, the existing literature pertaining to the research topic is discussed. A manuscript that has been written for submission to the Journal of Nutrition Education and Behavior is presented in Chapter 3. Lastly, a summary of conclusions and implications for Nevada are discussed in Chapter 4.

This chapter will begin by explaining the research problems, including a discussion of research pertaining to how socio-economic status (SES) is associated with food intake patterns and dietary quality. The context, purpose and methods of this thesis study are also explained.

Statement of the Problem

The Supplemental Nutrition Assistance Program (SNAP) is the largest food nutrition assistance program in the United States. SNAP, formerly named the Food Stamp Program (FSP), began as a temporary food stamp program intended to distribute surplus food during the Great Depression, but has grown to a nationwide program serving around 45 million people nationally each year. According to the Food stamp Act of 1977, the purpose of SNAP is “to alleviate hunger and malnutrition by increasing food purchasing power for all eligible households who apply for participation.”

In 1981, the Food Stamp Act of 1977 was amended to provide states with the option of participating in the Food Stamp Nutrition Education Program (SNAP-Ed).
According to the FY 2017 SNAP-Ed Federal Guidance, the goal of SNAP-Ed is, “to improve the likelihood that persons eligible for SNAP will make healthy food choices within a limited budget and choose physically active lifestyles consistent with the current Dietary Guidelines for Americans and the USDA food guidance.”\(^6\) (p.12) SNAP-Ed programs must be evidence-based and therefore, much research has been conducted to characterize persons eligible for SNAP. Many researchers have attempted to do this by examining social determinants of health. Social determinants of health are defined by the World Health Organization (WHO)\(^7\) as, “the conditions in which persons are born, grow, live, work, and age.” WHO states that social determinants of health are the main cause of health inequities.\(^8\) Research has shown that health inequities may exist among persons of different levels of socioeconomic status (SES). More specifically, researchers have reported that low SES is associated with poorer health.\(^9,10\)

The relationship between SES and food intake patterns has also been examined. In 2015, Kell et al\(^11\) studied the relationship between SES and dietary patterns in black and white adults in the US. The investigators measured SES using education, household income, and community-level SES. In addition, they identified five dietary patterns for their study: 1)”convenience pattern” (mixed dishes with meat, pasta dishes, Mexican dishes, pizza, red meat, soup, Chinese dishes, French fried white potatoes, non-fried white potatoes, and beans/legumes), 2)”plant-based” (vegetables, fruit, fish, breakfast cereal, beans/legumes, and soup), 3)”sweets/fats” (sugar, dessert, bread, chocolate, candy, added fats, sweet breakfast foods,
margarine, high-fat dairy products, and tea). 4) “southern” (fried foods, organ meat, processed meat, eggs and egg dishes, added fats, sugar-sweetened beverages (SSB), bread, red meat, and high-fat milk), and 5) “alcohol/salads” (salad/dressing/sauces, green leafy vegetables, wine, butter, liquor, coffee, eggs and egg dishes, condiments, tomatoes, and red meat). Previously in 2013, the team of investigators of this study had reported that the “plant-based” pattern was associated with a lower risk for stroke and that the “southern” pattern was associated with increased risk for stroke.12

The investigators reported in their 2015 study that higher SES (for all three of their measures) was associated with higher adherence to the “plant-based” and “alcohol/salad” patterns.11 In addition, they reported that higher SES was associated with lower adherence to “sweet/fats” and “southern” patterns. The researchers also examined the differences in dietary patterns based on SES among black and white participants. In the highest income category for both groups, white participants reported significantly higher adherence to the “alcohol/salads” pattern compared to black participants. Within the same education group, black participants reported lower adherence to the “plant-based” pattern and higher adherence to the “sweets/fats” diet, compared to white participants. Lastly, Kell et al11 reported that there was a significant difference between white and black participants in the association of community SES and adherence to the “convenience pattern.” White participants reported higher adherence to the “convenience” pattern compared to
black participants of the same community SES. The authors concluded that SES and race have an influence on dietary patterns.\textsuperscript{11}

The relationship between income level, specifically, and diet quality has also been investigated by multiple researchers. One study conducted by the USDA\textsuperscript{13}, \textit{Diet Quality of Low-Income and Higher Income Americans in 2003-04 as Measured by the Healthy Eating Index-2005} examined this relationship using the Healthy Eating Index-2005 (HEI-2005) to measure diet quality. The HEI is a score that measures a person’s adherence to the Dietary Guidelines for Americans recommendations. The score is an aggregate of 12 separate scores: total fruit; whole fruit; total vegetables; dark green/orange vegetables and legumes; total grains; whole grains; milk; meat/beans; oils; saturated fat; sodium; and solid fats, alcohol, and added sugar. The researchers of this study utilized National Health and Nutrition Examination Survey (NHANES) data from 2003 to 2004 and reported that low-income and high-income populations did not have significantly different HEI scores (56.6 and 57.8, respectively). However, families reporting low income had significantly lower component scores for total vegetables, dark green/orange vegetables and legumes, and whole grains compared to families reporting high income. In addition, families reporting low income also had a higher component score for sodium (which indicates lower sodium consumption). The research mentioned above provides evidence that SES is associated with food intake patterns and dietary quality. SNAP-Ed is intended to implement strategic programs that give persons of low SES the resources to make healthier food and physical activity choices.
Context

This thesis study is one component of a statewide needs assessment for Nevada’s SNAP-Ed Program led by Dr. Jamie Benedict. The goals of this assessment are “1) to describe the most pressing nutrition and physical activity needs of SNAP participants in Nevada and 2) to examine relevant community characteristics and other environmental factors that shape nutrition and physical activity behavior for the purpose of identifying opportunities for policy, system, and environmental (PSE) interventions/approaches.” A steering committee was developed to help direct the assessment with the help of Nevada’s SNAP-Ed Coordinator. The eight steering committee members were selected using the following criteria: 1) very familiar with SNAP-Ed target audience, 2) have the experience and/or education to provide subject-matter expertise related to nutrition and physical activity, and 3) have the time and interest to provide input at three different times during the assessment.

The statewide needs assessment for Nevada is composed of four phases. The first phase involves gathering and summarizing existing data to characterize Nevada SNAP participants and low-income communities. Phase 2 involves interviewing key informants. The purpose of these interviews is to learn about their perceptions of the needs of SNAP households and others residing in low-income households as well as opportunities at the Policy, Systems, and Environmental (PSE) level to facilitate healthful nutrition and physical activity. The third phase will involve a telephone survey of randomly selected SNAP households in Nevada. The purpose of the survey is to learn what they perceive to be their nutrition, food security, and physical
activity needs. The final phase of the needs assessment involves in-person forums directed by the Nevada Division of Welfare and Supportive Services where the report will be analyzed and used to create short and long-term goals for Nevada’s SNAP-Ed plan. One of these forums has already taken place. Phase 2 is included in this thesis study. The findings of the assessment will be used to help inform SNAP-Ed programs.

The theoretical basis for this thesis study will be the Social Ecological Model (SEM). This model is also included in the 2015-2020 Dietary Guidelines for Americans. Brofenbrenner,15 who created the model, proposes that behavior is affected by multiple levels of influence. According to Gregson et al,16 the Social Ecological Model involves five levels of influence: 1) individual, 2) interpersonal, 3) institutional/organizational, 4) community, and 5) social structure, policy, and systems. The first level, individual, includes knowledge, attitudes, beliefs, and personality traits that can influence behavior. The next level is interpersonal. The interpersonal relationships and groups such as family and peers provide an individual with social identity and a role in life. The next level of influence is institutional or organizational. This level includes worksites, schools, or religious groups. Beyond the organizational level is the community level. This level involves social networks, norms, and standards among individuals and groups. According to The last level of influence is social structure, policy, and systems. This is the broadest level that includes local, state, and federal policies and laws. Research has
suggested that utilizing multiple channels of the SEM is an effective strategy to promote and reinforce healthy nutrition behavior.\textsuperscript{16}

The latest SNAP-Ed Guidance emphasizes utilizing PSE interventions. PSE approaches are complementary to the SEM. According to SNAP-Ed Plan Guidance\textsuperscript{6} (p.34) policy is “a written statement of an organizational position, decision, or course of action.” The Guidance\textsuperscript{6} (p.34) defines systems as “...unwritten, ongoing, organizational decisions or changes that result in new activities reaching large proportion of people the organization serves.” Lastly, the Guidance states that environmental changes “...include the built or physical environments which are visual/observable, but may include economic, social, normative or message environments.” These approaches all involve stimulating behavior change by reaching large groups of people or communities. As stated above, the SEM proposes that behavior change is affected by multiple levels of influence.\textsuperscript{15} Therefore, this thesis study will use the SEM as a framework and aim to determine how PSE interventions may be used to support behavior change.

\textbf{Purpose and Methods}

The purpose of this thesis study is to describe the perceptions of key informants regarding the nutrition and physical activity needs of SNAP participants and others residing in low-income communities. Qualitative methods were employed to address the study objectives. The results will be used by the Nevada Division of Welfare and Supportive Services to determine priorities and strategies for Nevada’s SNAP-Ed Plans.
The objectives for this thesis study are as follows:

1. To describe the perceptions of key informants regarding the nutrition, food security and physical activity needs of SNAP participants and others residing in low-income communities.

2. To describe the perceptions of key informants regarding opportunities at the policy, system and environmental level to facilitate healthful nutrition and physical activity behaviors with an emphasis on low-income communities.

In the study, semi-structured interviews were conducted with key informants resulting in qualitative data. The sample of key informants included professionals from different Nevada geographies, disciplines, as well as levels of influence. The sample also included persons with experience and knowledge of special populations in Nevada. The results will be used to inform SNAP-Ed programs.

In this chapter, the research problem was explained, including a discussion of research pertaining to how socio-economic status (SES) is associated with food intake patterns and dietary quality. The context, purpose and methods of this thesis study were also discussed.
Chapter 2

Review of the Literature

As groundwork for this thesis study, research related to health disparities in the United States and the Supplemental Nutrition Assistance Program (SNAP) are first discussed in this review of the literature. Next, the barriers and facilitators of making healthful choices among individuals of low-income are explained. In addition, needs assessments and asset mapping are briefly described. Finally, the use of the social ecological model (SEM) and mixed methods research is explained as a basis for this thesis.

Health Disparities in the United States

The health and disease status of individuals is influenced by a number of factors, some of which are referred to as social determinants of health. The World Health Organization (WHO) defines social determinants of health as “the conditions in which persons are born, grow, live, work, and age.”

Healthy People 2020 is a ten-year agenda to improve the health of Americans, prepared by the Office of Disease Prevention and Health Promotion (CDC). Part of the Healthy People 2020 mission is to increase public awareness and understanding of the social determinants of health. The description of social determinants of health from Healthy People 2020 is much broader, compared to WHO, and the agenda states that the determinants can range from biology and genetics to policymaking.

WHO reports that the social determinants of health are the main cause of health inequities, also referred to in the literature as health disparities. According
to the CDC, a health disparity is present when differences in health determinants or health outcomes are present between populations.⁸ Healthy People 2020 define health disparity as, “a particular type of health difference that is closely linked with social, economic, and/or environmental disadvantage.”¹⁷ The agenda states that a number of characteristics such as race or ethnicity, sex, age, socioeconomic status (SES), and geographic location all contribute to the health of individuals.¹⁷

In regards to SES, research has shown that low SES is correlated with poorer health.⁹,¹⁰ For example, according to Braveman and Egerter¹⁹ adults at <100% of the federal poverty line (FPL) are five times more likely to report poor or fair health than those adults at ≥400% FPL. In a commentary by Adler and Stewart²⁰ recent research regarding the mechanism by which SES affects health was discussed. The four main mechanisms listed were 1) differential access to healthcare, 2) environmental exposures, 3) health behaviors, and 4) differential exposure to stress. As a part of their discussion of differential access to healthcare, a study conducted in 2007 by Holahan et al²¹ was discussed. The authors reported that young, low-income adults have the highest uninsurance rates. Holahan et al²¹ also reported that low-income uninsured adults are worse off on several measures of healthcare access and utilization.²¹ However, this mechanism has likely changed since the enactment of the Patient Protection and Affordable Care Act in 2010. According to the U.S. Census Bureau,²² there has been a decline in rates of uninsured adults since many provisions of The Act went into effect in 2014 (including the expansion of
Medicaid and the establishment of health insurance marketplaces). The uninsured rate in 2014 was 10.4%, 2.9 percentage points lower than the rate in 2013.

The second mechanism listed by Adler and Stewart\textsuperscript{20} was environmental exposures. A notable study included in the commentary conducted in 2002 by Evans et al\textsuperscript{23} examined the relationship between SES and environmental conditions. The authors reported that income was inversely correlated with poor environmental conditions such as hazardous wastes, ambient and indoor pollutants, water quality, and residential crowding.

Health behaviors such as smoking, physical activity, and unhealthy diets were the third mechanism mentioned by Adler and Stewart\textsuperscript{20} The authors reported that these health behaviors were related to SES. Adler and Stewart\textsuperscript{20} used the obesity epidemic as an example and stated in the commentary that obesity results from diet and exercise behaviors that affect energy intake and expenditure. A systematic review by Wang and Beydoun\textsuperscript{24} was mentioned in the commentary in the discussion of obesity. Wang and Beydoun\textsuperscript{24} described the obesity epidemic and examined existing disparities. They reported that groups of low SES were disproportionately affected by overweight and obesity.

The final mechanism listed was differential exposure to stress. The commentary discussed an article by Feldmen et al\textsuperscript{25} who conducted a study regarding how neighborhood SES was associated with physical functioning. They reported that living in a lower SES neighborhood was associated with higher perceived neighborhood strain. This, in turn, was reported to be related to less
sense of control and increased financial strain, which can lead to poor physical
functioning.

In addition to individual SES, researchers have also examined the SES of
specific neighborhoods. For example, Ross and Mirowsky\textsuperscript{26} examined the
relationship between neighborhood SES and health using data from the 1995 Survey
of Community, Crime and Health. Neighborhood SES was measured by education,
home ownership, and poverty in the respondents’ census tracts. Health was
measured by physical functioning. Respondents were asked about difficulty going
up or down stairs, kneeling, lifting more than 10 pounds, preparing meals or
cleaning the house, getting around town, seeing, and hearing. When controlling for
personal SES, the authors reported that residents in socially disadvantaged
neighborhoods have significantly higher levels of impairment in physical
functioning when compared to more advantaged neighborhoods. However, the
effect of neighborhood SES on health was small compared to the effect of individual
SES.\textsuperscript{26}

Since research has indicated that SES is related to health outcomes, it is
important to identify who is at greater risk to experience low SES. One resource for
this information is the \textit{CDC Health Disparities and Inequalities Report} (CHDIR)
published in 2011.\textsuperscript{18} The report assessed “access disparities across a wide range of
diseases, behavioral risk factors, environmental exposures, social determinants, and
health care access.”\textsuperscript{8 (p.3)} A supplement to this report was published in 2013, which
provides analysis of 19 topics covered in the 2011 report as well as data on 10 new topics.8

The 2013 CHDIR included a section examining education and income, both indicators of SES.8 The researchers at the CDC utilized 2009 and 2011 data from the Current Population Survey (CPS) to analyze progress towards eliminating health disparities by examining the prevalence of noncompletion of high school and poverty. First, the CDC reported on educational attainment for those who were 25 years or older in 2011. The CDC reported that those in older age groups (65-79 or ≥ 80 years) had significantly higher rates of noncompletion of high school compared to the younger group (45-64 years). Hispanics also had a significantly high rate of high school noncompletion compared to non-Hispanic whites.

In the report, poverty level groups were determined using the income-to-poverty ratio (IPR). Noncompletion of high school in the poor (IPR < 1), near poor (IPR 1.00-1.9), and middle income (IPR 2.00-3.9) groups was significantly higher compared to the high income group (IPR ≥ 4.0). Significant absolute differences in noncompletion of high school were reported between adults with and without disabilities. Disabled adults reported higher noncompletion of high school compared to adults without disabilities.8

Next, the CDC reported on educational attainment of adults in the age range of 18-24.8 In contrast to what was found in the for the older subgroup, a higher proportion of adults 18-19 years old did not complete high school compared to the adults age 20 to 24. Noncompletion of high school was significantly higher in near-
poor (IPR 1.00-1.9) or poor (IPR < 1.00) adults compared to high-income adults (IPR ≥ 4.0). Disabled adults age 18-24 also had significantly higher noncompletion of high school.\(^8\)

In addition, the CDC reported on all adults older than 18-years-old in their analysis of income.\(^8\) In 2011, significant absolute differences in percentages of adults in poor families (IPR <1) were found among young adults, Hispanics, non-Hispanic blacks, and adults that had not completed high school. For both sexes, those age 18-24 years had a significantly higher percentage of persons in families with an IPR < 1 compared to the reference group (age 45-64). Hispanics and non-Hispanic blacks had significantly higher percentage of persons in families with an IRP <1 compared to white, non-Hispanics. Lastly, those with an education status of less than high school and high school graduate (or equivalent) had significantly higher percentage of persons in families with an IRP <1 compared to college graduates.

Overall, the report’s findings confirm that disparities in the completion of high school and poverty still remain in the U.S. adult population.\(^8\) As a result of their analysis, the CDC concluded that specific groups may be at a greater risk for early onset of poor health due in part to low SES. These groups include those younger than 24 years of age, non-Hispanic blacks, Hispanics, and low-income adults.\(^8\)

In addition to SES, many research studies have also been conducted to understand how factors such as diet and nutrition contribute to health disparities. In a commentary published in 2009, Satia\(^{27}\) defined diet-related disparities as
differences in dietary intake, behavior, and/or patterns among different segments of a population. These differences, according to Satia, result in poorer dietary quality and negative health outcomes in certain demographic groups. Negative health outcomes include a higher incidence and poorer survival of many diet-related chronic diseases and conditions such as cardiovascular disease, hypertension, cancer, Type II diabetes, and obesity. For example, according to a study by Casagrande et al., that utilized data from the National Health and Nutrition Examination Survey (NHANES) data from 1999-2002, non-Hispanic blacks were significantly less likely than non-Hispanic whites to meet USDA fruit and vegetable guidelines.

According to Satia, a number of factors are correlated with diet-related disparities. Domains of social inequality including race/ethnicity, racism, the physical environment, and language barriers are the first set of factors that Satia cited as contributors. Demographic characteristics also contribute to diet-related health disparities. Satia lists age, gender, employment status, education, income, and family structure/composition as factors associated with differences in dietary intake, and therefore, potential contributors to disparities. An article by Eyler et al. was discussed in the commentary as an example. They reported that low education level, low income, and having young children are all factors associated with high fat intake.

Next, Satia listed psychosocial factors as key contributors to diet-related disparities. One of the studies discussed in the commentary was published by
Watters et al\textsuperscript{30} in 2007. The authors reported that belief in the importance of a diet high in fruits and vegetables and high self-efficacy (defined in the article as “confidence in one’s ability to do certain behavior”) were significantly associated with higher fruit and vegetable intake.

Another contributor reported by Satia\textsuperscript{27} was environmental factors. Satia discussed the results from a study by Vitolins et al\textsuperscript{31} as an example. According to Vitolins et al,\textsuperscript{31} older adults in rural communities in central North Carolina did not meet dietary recommendations (from the Food Guide Pyramid and National Cancer Institute’s 5 A day campaign) and over-consumed fats, oils, sweets, and snacks. The authors attribute this trend in part to the environmental barrier of the rural community such as distance to stores and lack of public transportation.

A final factor reported by Satia\textsuperscript{27} was dietary acculturation. Satia cited the results from a systematic review by Ayala et al\textsuperscript{32} in their discussion of acculturation. They examined the relationship between acculturation and diet among Latinos in the US. The authors reported that those less acculturated consumed more fruits, rice, beans, and less sugar and sugar-sweetened beverages than those who were more acculturated. Therefore, the authors concluded that acculturation is associated with less healthful dietary behavior.

In a related review article, Darmon and Drewnowski\textsuperscript{33} describe “social class” and its association to diet quality. They concluded that individuals of high SES are more likely to consume whole grains, lean meats, fish, low-fat dairy, and fresh vegetables and fruit. In addition, they reported that individuals of low SES are more
likely to consume diets rich in refined grains and added fats. However, they found little evidence indicating that macronutrient and energy intakes were related to SES. Proposed mechanisms for the observed difference that the authors synthesized from the literature were food costs, food access, food environment, education, and culture.\(^\text{33}\)

Later in 2010, a study on the influence of adult and childhood SES on adult food intake patterns was conducted in Denmark by Hare-Bruun et al.\(^\text{34}\) The researchers were interested in examining childhood SES in addition to adult SES, since food preferences are partly established during childhood. They utilized data from a 20- to 22-year follow-up survey. Using principle component analysis, they identified two dietary pattern factors for their analysis. The first was the “traditional-western food pattern.” This pattern included red meat, sauce and dressings, potato dishes, meat and pâté, fast food, salty snacks, cakes and biscuits, rye bread, sweets, sugar-sweetened drinks and fruit juice, eggs, and desserts. The second pattern identified was the “green food pattern.” This pattern included raw vegetables, cooked vegetables, fresh fruit, dried fruit and nuts, poultry, fish, eggs, cereal, desserts, and pasta, rice, and bulgur. The authors reported that, for men, the reporting of low adult SES was associated with significantly higher adherence to the “traditional-western food pattern.” Women that reported low adult SES had higher adherence to that food pattern as well, but the results were not significant. High adult SES was related to significant higher adherence to the “green food pattern” in men and women. Women that reported high childhood SES had significantly higher
adherence to the “green food pattern” compared to those that reported low childhood SES, independent from their reported adult SES. However, the reported child SES of men did not have an association with adult eating patterns. The researchers concluded that SES is important in the development of adult food patterns. More specifically, childhood SES seems to be an important factor in adult dietary patterns of women, while adult SES seems to be more important in the development of adult dietary patterns in men.34

In 2011, Cutler et al35 conducted a study to examine the relationship between socioenvironmental and sociodemographic characteristics to dietary patterns among adolescents. They used data from Project EAT (Eating Among Teens), an ongoing observational study of a diverse group of adolescents in Minnesota. Participants were surveyed in 1998-1999 and resurveyed in 2003-2004. The sociodemographic measures utilized were SES and race/ethnicity. SES was determined using parental education level, family eligibility for public assistance, and employment status of the students' mother or father. Socioenvironmental measures used were family meal frequency, parental support for healthy eating, peer support for healthy eating, healthy home food availability, and unhealthy home food availability. The authors reported that SES was positively associated with vegetable and fruit and starchy food patterns and inversely associated with the fast food pattern. In addition, family meal frequency and home availability of healthy foods were positively associated with vegetable and fruit and starchy food patterns and inversely associated with fast food patterns. The authors concluded that
socioenvironmental factors, in addition to sociodemographic are associated with dietary patterns.\textsuperscript{35}

More recently in 2015, Kell et al\textsuperscript{11} examined the associations between SES and dietary patterns in black and white adults in the US. The researchers utilized three measures of SES (individual education, household income, and community-level SES) as well as five dietary patterns (based on the participants’ dietary assessments) for their analysis. The first dietary pattern identified was the “convenience pattern”. This pattern included mixed dishes with meat, pasta dishes, Mexican dishes, pizza, red meat, soup, Chinese dishes, French fried white potatoes, non-fried white potatoes, and beans/legumes. The second pattern, “plant-based”, included vegetables, fruit, fish, breakfast cereal, beans/legumes, and soup. The next dietary pattern utilized was “sweets/fats”, which included sugar, dessert, bread, chocolate, candy, added fats, sweet breakfast foods, margarine, high-fat dairy products, and tea. The “southern” dietary pattern included fried foods, organ meat, processed meat, eggs and egg dishes, added fats, sugar-sweetened beverages (SSB), bread, red meat, and high-fat milk. The last dietary pattern utilized was the “alcohol/salads” pattern. This pattern included salad/dressing/sauces, green leafy vegetables, wine, butter, liquor, coffee, eggs and egg dishes, condiments, tomatoes, and red meat. The team of investigators of this study had previously reported in 2013 that the “plant-based” pattern was associated with a lower risk for stroke and that the “southern” pattern was associated with increased risk for stroke.\textsuperscript{12}
The investigators reported, in their 2015 study, that higher SES for all three measures was associated with higher adherence to the “plant-based” and “alcohol/salad” patterns. They also reported that higher SES was associated with lower adherence to “sweets/fats” and “southern” patterns. The researchers noted some differences in dietary patterns based on SES among blacks and whites. First, there was a significant difference between black and white participants in the association between household income and adherence to the “alcohol/salads” pattern. In the highest income category for both groups, white participants reported higher adherence to the “alcohol/salads” pattern compared to black participants. In addition, there was also a significant difference between black and white participants in the association between individual education and adherence to the “plant-based” and “sweets/fats” patterns. Black participants reported lower adherence to the “plant-based” pattern and higher adherence to the “sweets/fats” diet, compared to white participants from the same education group. Finally, there was a significant difference between black and white participants in the association between community SES and adherence to the “convenience” pattern. White participants reported higher adherence to the “convenience” pattern compared to black participants of the same community SES. The authors concluded that SES and race have an effect on dietary patterns.

Researchers have also studied whether or not a nutrient-rich diet is more expensive. In 2012, Aggarwal et al examined the relationship of nutrient density with diet costs. They also sought to determine if a significant proportion of those
eating lower-quality diets were of low SES. The researchers utilized data from the Seattle Obesity Study (S.O.S.), which gathered information via telephone interviews and written food frequency questionnaires, in which participants recorded the frequency of consumption of foods and beverages along with portion sizes. They reported that for Vitamins A, C, D, E, B\textsubscript{12}, beta carotene, folate, iron, calcium, potassium, magnesium, and fiber, lower intakes were associated with significantly lower diet costs. When looking at cost difference between the highest and lowest quartile of nutrient intakes, vitamin C, beta carotene, potassium, and magnesium had the largest diet cost differences (meaning diets high in these nutrients were generally more expensive). High intakes of saturated fats, trans fats, and added sugar were associated with significantly lower diet costs. In addition, those participants whose diets were high in saturated fats and trans fats were associated with significantly lower SES. This study indicated that a diet of nutrient-dense foods is more expensive, and that individuals of lower SES are more likely to have a diet low in these nutrient-dense foods.\textsuperscript{36}

As stated above, SES may be a significant contributing factor to diet-related disparities. Much research has been conducted to describe diet quality by income level (indicating a diet-related health disparity). One example is, the USDA report, *Diet Quality of Low-Income and Higher Income Americans in 2003-04 as Measured by the Healthy Eating Index-2005*.\textsuperscript{13} The Healthy Eating Index-2005 (HEI-2005) was used to measure diet quality here. The HEI is a score that measures a person’s adherence to the Dietary Guidelines for Americans recommendations. The score is
an aggregate of 12 separate scores: total fruit; whole fruit; total vegetables; dark green/orange vegetables and legumes; total grains; whole grains; milk; meat/beans; oils; saturated fat; sodium; and solid fats, alcohol, and added sugar. Using NHANES data from 2003 to 2004, the researchers reported that low-income and high-income populations did not have significantly different HEI scores (56.6 and 57.8, respectively). However, important differences were present in some component scores. Families reporting low income had a significantly lower component scores for total vegetables, dark green/orange vegetables and legumes, and whole grains compared to families reporting high income. Families reporting low income also had a higher component score for sodium (which indicates lower sodium consumption).¹³

Another recent study by Langevin et al.³⁷ intended to evaluate weight status and diet quality in children 7-13 years from urban, low-income communities. The sample was selected from a larger study on vitamin supplementation, in which, African-American and Hispanic children were randomly selected from 28 schools in urban and low-income areas near Newark, NJ. Fifteen of the schools were willing to participate in the second study. From the children in those schools, 248 children were randomly selected to be in this cross sectional study. They found that 22% of the children were at risk for overweight and 36% were overweight. Over 75% of the children failed to meet the recommended servings of dairy, fruit, vegetables, and grains. This study did not compare these children with higher-income children, so it
is unclear whether or not their dietary pattern was associated to their low-income status.37

In addition to the diet quality of individuals with low-income, it is also important to examine the prevalence of food insecurity. According to the Food and Nutrition Service (FNS), food insecurity occurs when one has difficulty getting enough food due to lack of resources.38 Someone may also be deemed food insecure if they can obtain appropriate quantity and quality of food, but must do so in a socially unacceptable way.3 According to the USDA, in 2014, 14% of households in the U.S. were food insecure at some point during the year.39 Approximately 5% of households had very low food security. This form of food insecurity indicates that food intake of some household members was reduced and normal eating patterns were disrupted due to limited finances or other resources. The USDA also reported that rates of food insecurity were substantially higher for households with incomes near or below the Federal Poverty Line (FPL), households with children headed by a single parent, women living alone, and Black- and Hispanic- headed households compared to the national average.39

One of the goals of the Supplemental Nutrition and Assistance Program (SNAP) is to decrease the likelihood that a low-income person will experience food insecurity.6 As stated above, food insecurity is defined as a limited ability to obtain or consume an appropriate quality and quantity of food.3 Research has been conducted to determine the impact of SNAP on food insecurity. One such study conducted in 2013 by Mabli et al.40 utilized data from the SNAP Food Security
Survey, which was conducted by Mathematica Policy Research for FNS from October 2011 to September 2012, to measure SNAP’s association with food insecurity. The authors found that SNAP participation for about six months was associated with improved food insecurity. Another study conducted in 2009 by Nord and Golla\textsuperscript{41} examined SNAP’s association to food insecurity. They used data from the Food Security Survey Supplement of the Current Population Survey (CPS) from 2001 to 2006 and constructed two-year panels by matching households surveyed two years in a row. Their goal was to examine the possible self-selection bias of SNAP participants and how enrolling in SNAP may influence food insecurity month to month. The self-selection bias theory is that households that are more food insecure are more likely to enroll in SNAP. Therefore, the differences in food security status between SNAP participants and income-eligible nonparticipants may be greater than the effect of SNAP on food security. The authors reported that food security was low in the 6 months prior to enrolling in SNAP, but increased shortly after enrolling in SNAP. This indicates that there may be self-selection bias present, since households appear to enroll in SNAP when they are less food secure. They concluded that SNAP is associated with moderate amelioration of food insecurity.\textsuperscript{41}

In addition to food insecurity, other researchers have attempted to understand the association of SNAP and dietary quality. A recent comprehensive systematic review synthesized results from studies measuring dietary quality of adults participating in SNAP compared to eligible nonparticipants and/or ineligible nonparticipants.\textsuperscript{42} The criteria listed for inclusion in the systematic review was as
follows: be peer-reviewed, utilized U.S. data, provided original data on the association between SNAP participation and dietary outcomes, published in English, published between January 2003 and August 2014, provided a comparison group for SNAP participants (income-eligible nonparticipants or higher-income nonparticipants), and did not utilize food insecurity or obesity as the only outcomes. Twenty-five studies were included in the review. A majority of these studies reported results based on nationally representative data sets. Ten of the twenty-five studies utilized data from NHANES.\textsuperscript{42}

First, the researchers assessed the SNAP participants’ dietary quality compared to income-eligible nonparticipants.\textsuperscript{42} Across all studies there was consistent evidence that there was no difference among SNAP participants and income-eligible non-participants in consumption of meat, milk or milk products, fats and oils, or sweets and desserts. Next, the researchers reported on vitamin and mineral intake. Zinc intake was significantly lower among SNAP participants compared to income-eligible nonparticipants. The results on intake of other minerals and vitamins were different from study to study (some reporting lower intake in SNAP participants and some reporting no difference). For calcium, a convenience sample of Black women enrolled in SNAP had higher calcium intake compared to income-eligible nonparticipants.\textsuperscript{43} In a nationally representative sample, SNAP participants age 19-30 reported lower calcium intake than income-eligible nonparticipants.\textsuperscript{44} Other studies reported no difference in calcium intake. Most studies found no difference in reported fiber intake between the two groups.
However, 19-31 and 51-70 year old SNAP participants had lower fiber intake than income-eligible nonparticipants in one national study. Iron results were similar to those of calcium. Intake was similar between the two groups, but intake was reported to be lower in SNAP participants compared to income-eligible nonparticipants in one national study.

Most studies included in this systematic review reported that there was no difference in energy intake among SNAP participants and income-eligible nonparticipants, however a few studies showed variation based on age. In one study, SNAP participating women 19-30 years old consumed significantly more calories than income-eligible nonparticipants, while women 31-50 years old consumed significantly less than the comparison group. Therefore, the authors concluded that the women 19-31 years old had higher energy intake compared to the women 31-50 years old. Ten studies included in the systematic review examined SSB consumption of adults participating in SNAP. Results from four of the studies indicated that adults participating in SNAP consumed significantly higher amounts of SSB, while the other 6 studies indicated no difference in consumption.

Multiple studies included in the systematic review utilized HEI scores. Results consistently indicated that diets of all population groups do not meet dietary recommendations. The investigators of one study that utilized NHANES data reported that SNAP participants do not have significantly different HEI scores than income-eligible nonparticipants. However, investigators of three other studies...
reported that SNAP participants have significantly lower HEI scores than income-eligible nonparticipants.

Next, the investigators examined the diet quality of children participating in SNAP compared to income-eligible nonparticipating children. No significant differences were noted for any of the dietary indicators.42

The authors of the systematic review also compared the diet quality of adults participating in SNAP with higher-income non-eligible nonparticipating adults. They reported that adults enrolled in SNAP scored significantly lower on the majority of dietary measures, including HEI score, compared to higher-income adults. SNAP participants also had lower intakes of vitamin C, calcium, fiber, and iron. However, SNAP participants had lower sodium intakes compared to higher-income nonparticipants.42

Lastly, the authors of the systematic review compared the diet quality of SNAP-participating children to higher-income nonparticipating children.42 Only two studies44,50 included in the systematic review focused on this particular comparison. The authors reported that SNAP-participating children had lower HEI scores when compared to higher-income children. In addition, SNAP-participating children reported lower intake of vitamin C, calcium, and iron and higher intake of SSB and sodium.42

The authors of the systematic review concluded that SNAP participants had similar caloric, macronutrient, and micronutrient intake compared to income-eligible nonparticipants.42 However, SNAP participants, in general, had a lower
quality diet compared to income-eligible and higher-income nonparticipants. The systematic review had a number of limitations. First, there was considerable variability and inconsistency in the study designs that were included. Another limitation of the systematic review is that most of the included studies did not attempt to demonstrate causality in describing the diets of SNAP participants. In addition, self-selection bias is present in these the studies. The SNAP participants included in the studies may suffer more severely from food insecurity than those who did not choose to participate in SNAP.⁴²

In 2016, a unique study was conducted in which food purchase data of SNAP participants was analyzed, rather than self-reported consumption data, to study diet quality. Garasky et al.⁵⁵ published the report entitled, *Foods Typically Purchased by Supplemental Nutrition Assistance Program (SNAP) Households* through the USDA. The researchers used point-of-sale (POS) food purchase data to explain what foods are typically purchased by households receiving SNAP benefits, and how that compares to non-SNAP households. The POS data was from a leading grocery retailer from January to December in 2011.

The researchers reported that there were no major differences in expenditure patterns of SNAP and non-SNAP households. SNAP households spent about 40 cents from every dollar on meat, fruits, vegetables, milk, eggs, and bread. The SNAP households spent about 20 cents from every dollar on sweetened beverages, desserts, salty snacks, candy, and sugar. The final 40 cents from every dollar were spent on cereals, prepared foods, dairy products, rice, and beans. Both
SNAP households and non-SNAP households had the same top 10 summary
categories, but they were in slightly different orders. SNAP households top 10
summary categories were in the following descending order: meat/poultry/seafood,
sweetened beverages, vegetables, frozen prepared foods, prepared desserts, high-fat
dairy/cheese, bread and crackers, fruits, milk, and salty snacks. The top 10
descending summary categories for non-SNAP household were: meat/poultry and
seafood, vegetables, high fat dairy/cheese, fruits, sweetened beverages, prepared
desserts, bread and crackers, frozen prepared foods, milk, and salty snacks. The
researchers concluded that SNAP households and non-SNAP households have
similar grocery purchasing patterns in the retail outlets that the data came from.

The Supplemental Nutrition Assistance Program

The three largest federal nutrition assistance programs in the U.S. are the
Supplemental Nutrition Assistance Program (SNAP), the National School Lunch
Program (NSLP), and the Special Supplemental Nutrition Assistance Program for
Women, Infants, and Children (WIC), all administered by the United States
Department of Agriculture (USDA), Food and Nutrition Service (FNS). Of these,
SNAP is the largest. SNAP, formerly named the Food Stamp Program (FSP), began
as a temporary food stamp program intended to distribute surplus food during the
Great Depression, but has grown to a nationwide program serving around 45
million people each year.

As mentioned above the first FSP began in the wake of the Great Depression. Farmers had excess commodities and were in need of more income. Secretary of
Agriculture Henry Wallace is credited with beginning the first Food Stamp Program (FSP). Participants in this program were able to buy orange stamps and for every $1 of orange food stamps purchased, they received an extra $0.50 worth of blue stamps. While the participants were able to use orange stamps to purchase any food, blue stamps could only be used to purchase surplus foods. In 1939, the first food stamp was purchased in Rochester, NY. During World War II, the improved economy led to a decrease in unemployment rates and in amount of surplus foods. As a result, the first FSP ended in 1943. It is estimated that around 20 million individuals received benefits during the 4 years of the first FSP.5

During the next 18 years, studies were completed to measure the effectiveness of the first FSP.56 Recommendations were made and were later incorporated into the new program. Two examples of proposed changes were to have only one kind of stamp and to make eligibility rules explicit. In 1959, Public Law 86-341 (11) gave authorization for the operation of a FSP by the Secretary of Agriculture. However, the President at the time, Dwight Eisenhower did not implement the program during his time in office. Then, in 1961, Kennedy signed an Executive Order to initiate The Food Stamp Pilot Program. This new program expanded the use blue stamps for any food, not only surplus.56

Later, The Food Stamp Act of 1964 was passed to make FSP permanent.5 The responsibilities of the program were split between the federal and state entities. The federal government funded benefits and authorized retailers, and the states certified applicants and issued stamps. In 1971, the Public Law 91-671 required national
eligibility standards for the program. Later in 1974, the program expanded to be nationwide. More provisions were made to the Program through the Food Stamp Act of 1977. The changes included targeting potential participants in the greatest need and tightened controls on the program to decrease the instances of fraud. The act also took away the purchase requirement to receive stamps. This was a barrier to potential participants previously. In addition, the Food Distribution Program on Indian Reservations was established in the Food Stamp Act of 1977. This gave Native Americans individuals that were eligible for food stamps the option of collecting either food stamps or commodity foods.5

The U.S. experienced a recession in the early 1980s, which led to cutbacks in the FSP.5 By the late 1980s, these cutbacks led to a serious hunger problem. In response, Congress eliminated sales tax on food stamp purchases and increased limit of allowable resources to $2,000 for eligible households.5

Participation in the program decreased in the late 1990s which prompted the Food Security and Rural Investment Act of 2002, which brought changes to the FSP program such as restoring eligibility to aliens who had been in the US for at least five years and met the other eligibility requirements.5 The program continued to evolve. For example, all states were mandated to implement an Electronic Benefit Transfer System (EBT) by 2002. EBT is an electronic system in which benefits are electronically deposited in the participants account. It operates similar to a debit card. This system makes it easier to track SNAP purchases and identify possible fraud.5
In 2007, the Great Recession caused an increase in unemployment and led to an all-time (non-disaster) peak in FSP participation of 29 million people per month in 2008.\textsuperscript{5,6} The state of Nevada was hit particularly hard during the Great Recession and saw an increase of approximately 144,000-200,000 SNAP participants from 2008 to 2009. Since then, participation has continued to increase in Nevada and the participation in February 2016 was estimated to be 438,000.\textsuperscript{3} Due to the increase in participation and demand for benefits, the 2008 Farm Bill increased the commitment to federal food programs to $10 billion for the following 10 years and also changed the name of the program from the Food Stamp Program to SNAP.\textsuperscript{5,6} The first reason for the name change was the fact that the program transitioned to EBT, rather than stamps. In addition, the name change aimed to decrease stigma associated with the program and its participants. In 2015, SNAP served over 45 million participants nationally with a cost of $69 billion.\textsuperscript{3}

According to the Food stamp Act of 1977, the purpose of SNAP is “to alleviate hunger and malnutrition by increasing food purchasing power for all eligible households who apply for participation.”\textsuperscript{4(p.2)} The program is intended to alleviate food insecurity and improve the nutrition status of individuals with low-income.\textsuperscript{5,6}

In order to be eligible for SNAP benefits, households must meet certain criteria. Participants must have a gross household income at or below 130% of the FPL and no more than $2000 in countable assets.\textsuperscript{1} Prospective participants apply for benefits through their local SNAP office who determines eligibility. The date of monthly benefit distribution differs by state. Nevada, for example, makes benefits
available to households on the first of every month. However, Arizona distributes benefits from the 1st to the 13th of the month, depending on participants’ last name.\(^5\) Currently, SNAP participants use EBT cards for their food purchases using SNAP benefits.\(^5\)

In the early 1980s, a new emphasis was placed on the diet quality of individuals participating in SNAP. In 1981, the Food Stamp Act of 1977 was amended to provide states with the option of participating in the Food Stamp Nutrition Education Program.\(^5\) Then, in the Farm Bill of 1990, state Food Stamp Agencies were given the option of applying for matching funds from the USDA for nutrition education. These matching funds would be used to deliver nutrition education to those eligible to receive food stamps. The state agencies were also given the option to involve subcontractors to aid in the implementation of nutrition education. Some examples of implementing agencies included Cooperative Extension Services, State Health Departments, and Indian Tribes. These agencies were reimbursed by the USDA for granted matching funds that were utilized for FSP programs. In the first year of Food Stamp Education Funding (1992) seven states had approved Food Stamp Nutrition Education plans. By 2007, food stamp nutrition education plans had expanded to 52 states and territories.\(^5\) The Healthy, Hunger-Free Kids Act of 2010 named The Supplemental Nutrition Assistance Program Education (SNAP-Ed) as the Nutrition Education and Obesity Prevention Grant Program. This put a new emphasis on obesity prevention, rather than solely
nutrition education. Physical activity promotion was also authorized as an important part of the nutrition education and obesity prevention grant program.\textsuperscript{6}

According to the 2017 SNAP-Ed Plan Guidance\textsuperscript{6} (p.12), SNAP-Ed aims to “improve the likelihood that persons eligible for SNAP will make healthy choices within a limited budget and choose active lifestyles consistent with the current 2015-2020 Dietary Guidelines for Americans and MyPlate.” The 2017 Plan Guidance defines program’s target audience to include SNAP participants and other low-income individuals who are eligible for SNAP benefits or other means-tested Federal Assistance Programs. The audience also includes “individuals who live in communities with a significant low-income population.”\textsuperscript{6(p.8)}

According to the 2017 SNAP-Ed Plan Guidance\textsuperscript{6}, SNAP-Ed has six guiding principles that states are encouraged to use as they operate. The first principle describes the individuals in which SNAP-Ed is intended to serve. These individuals are low-income and eligible for SNAP or other means-tested federal assistance programs. SNAP-Ed also serve individuals who live in a significant low-income community. The second guiding principle states that SNAP-Ed should implement nutrition education and obesity prevention services using a variety of educational strategies, along with environment policy, systems, and environmental interventions. Next, SNAP-Ed has the greatest potential impact when programs target low-income households with women and children. Women and children are a key subset of SNAP-Ed’s target population, so targeting them will maximize funding since it will capture a significant portion of SNAP recipients. The fourth principle is
SNAP-Ed should use evidence-based interventions that are focused on behavior change. SNAP-Ed can also make the greatest impact and reach more of their audience when coordination and collaboration occurs with other stakeholders. These stakeholders can be at local, state, regional, and national levels. The final guiding principle is the program is enhanced when roles and responsibilities of all levels of SNAP agencies are well defined and put into practice.6

State SNAP-Ed implementing agencies plan various nutrition and physical activity promotion programs. They often also work with other local health agencies that act as implementing agencies.6 State agencies prepare a SNAP-Ed Plan and submit it to the Food and Nutrition Service (FNS) for approval. Each state’s plan must include interventions at multiple levels of the Social Ecological Model. Therefore, it is required that states plans incorporate certain specified approaches. The first is individual or group-based approach. The second type of approach is comprehensive, multi-level interventions. The final approach involves community and public health approaches. States are expected to develop a SNAP-Ed plan that balances all of these approaches. The state’s plan must include a needs assessment of the nutrition, physical activity, and obesity prevention needs of their target population. State agencies are also required to coordinate their efforts with other FNS programs such as WIC.6

The FNS requires that projects included in State SNAP-Ed Plans must be evidence-based.6 This means that the projects are based on the best research evidence and the best practice-based evidence.
An important component of SNAP-Ed is needs assessments. In SNAP-Ed Plans, states are required to present data-driven needs assessments of nutrition, physical activity, and obesity prevention needs in their target population. This is important because SNAP-Ed is required to utilize the limited resources allocated in an effective and efficient way. Needs assessments allow state agencies to understand the needs and potential barriers to making healthy decisions of their target population. The agencies can then design their programs to meet the specific needs of their target SNAP-Ed population.6

As stated above, the SNAP-Ed programs are evidence-based and designed to address the specific needs of the population. One example of a SNAP-Ed program is the Stellar Farmers’ Market Program, which was operated in New York.58 This specific program was intended to increase fruit and vegetable consumption among low-income New Yorkers. The program was a collaborative effort between the NYC Department of Health and Mental Hygiene, the New York Department of Health, and the Office of Temporary and Disability Assistance. The purpose of this program was to provide education and resources for planning, purchasing, and preparing healthy meals to improve dietary habits. The program included free nutrition and cooking workshops at farmers’ markets in low-income neighborhoods. After the workshops, the participants completed a survey and received a Health Bucks coupon worth $2 to use towards the purchase of fresh produce at the market. The evaluation results showed that attendance of one or more classes was associated with a more positive attitude toward the consumption of fruits and vegetables. Attending two or more
classes was associated with increased fruit and vegetable consumption. The attendance of two or more classes was also associated with more confidence in the ability to prepare fruits and vegetables.\textsuperscript{58}

An example of a SNAP-Ed Program that has taken place in Nevada is the “All 4 Kids: Healthy, Happy, Active, Fit” program.\textsuperscript{59} The program was developed by the faculty of the University of Nevada Cooperative Extension (UNCE). The program helps children meet the Nevada Pre-Kindergarten standards and also encourages preschool students and families to eat a healthy diet and participate in physical activity daily. The first component of the program is directed towards the children. This involves 30-minute preschool lessons taught three times a week for eight weeks. UNCE staffers teach the lessons and each one involves teaching a life skill, a specific movement in the Nevada Pre-K standards, and lastly a nutrition concept. The second component of the program involves the families. Each week, the children bring home an All 4 Kids Pack that contains a nutrition activity for the family to complete together. Family and caregivers are also invited to a family event that they hold once a month, where there are interactive games and food demonstrations. According to UNCE, prior to the program, 83% of children were eating fresh fruit at least three times a week. Data from the program indicates that after the program nearly 92% of children were eating fresh fruit at least 3 times a week. Before participating in the program, 62% of children were eating fresh vegetables at least three times a week. After the intervention, 92% of the children were eating fresh vegetables at least three times a week.\textsuperscript{59}
As stated above, SNAP-Ed programs must be evidence based. Therefore, research must be done to evaluate the current programs. In 2016, Molitor et al. published an article regarding the effectiveness of SNAP-Ed programming for low-income mothers in California. The researchers utilized the Automated Self-administered 24-Hour recall dietary assessment via a telephone interview. The main measured they were interested were consistent with the central focus of SNAP-Ed in California. They found that mothers from high SNAP-Ed reach census tracts, versus low SNAP-Ed reach census tracts had significantly greater quantities of fruits in vegetables. In addition, the researchers reported consumption of 34.6 fewer calories from high-fat foods and 0.171 fewer cups of sugar-sweetened beverages in the mothers from high SNAP-Ed reach census tracts versus low reach. However, Healthy Eating Index-2010 scores did not differ based on level of SNAP-Ed reach. The researchers concluded that SNAP-Ed interventions in California are associated with increased fruit and vegetable intake and lower intake of high-fat foods and sugar-sweetened beverages.

**Barriers and Facilitators of Making Healthy Choices**

Studies discussed above have indicated that SNAP participants may have a lower diet quality than non-participants. Others have investigated this further in an attempt to identify barriers to eating healthy that exist for these individuals. Researchers that investigated what these barriers are, did so from the viewpoint of various experts or stakeholders. One study by Leung et al. conducted semi-structured in-depth interviews with experts from government, industry, advocacy,
and research organizations. One barrier to eating healthy or factor that reportedly influences purchasing behavior that the experts identified was the high cost of nutrient-rich food. Along with that they reported that another barrier was inadequate SNAP benefits to purchase this food. The final two barriers they reported were limited access to healthy foods as well as environmental factors associated with poverty. Some of these environmental factors were lack of supermarkets in low-income neighborhoods, the absence of nutrient rich food in convenient stores, and the fact that SNAP benefits may not be redeemed at farmer’s markets.\textsuperscript{61} Note that since this article was published, the use of SNAP benefits has been expanded to some farmer’s markets.\textsuperscript{62}

Participants in the study by Leung et al\textsuperscript{61} were also asked what they thought would be effective strategies to improve the nutrition of SNAP participants. One idea that was reported by the experts was to provide financial incentives for purchasing healthy food. Restriction of the purchase of nutrient poor foods using SNAP benefits was also proposed. As stated above, SNAP benefits are distributed to participants once a month. The experts in the study thought it would be beneficial to change the frequency of benefit distribution so that the participants receive benefits twice a month. According to one participant in the study from the academia sector, since SNAP participants only receive their benefits once a month, they typically buy a lot as soon as they receive their benefits. Since their purchases must last them through the month they typically buy processed, packaged foods. The experts believe that changing the distribution of benefits to be bi-monthly could result in a change in the
purchasing patterns of SNAP participants. The participants in the study also said that enhancing nutrition education such as allowing for more flexible education formats and a wider range of topic coverage would also be a good strategy. Finally, they reported that improving the SNAP retailer environment and increasing coordination of state and federal assistance programs would both aid in improving the nutrition of SNAP participants.61

Another study done in 2014 by Blumenthal et al63 also assessed the opinions of stakeholders in regards to SNAP participants’ barriers to eating healthy as well as strategies for improving dietary quality. The researchers conducted a web-based survey of 552 SNAP stakeholders using a 38-item closed-ended survey instrument. Three barriers to improving the diet quality of SNAP participants were identified most frequently by the stakeholders. The first barrier was the high level of marketing in low-income communities of unhealthy foods. The second barrier identified was the high cost of healthy foods. Finally, they identified lifestyle challenges as a barrier to eating a healthy diet. Lifestyle challenges that they identified as prevalent for low-income individuals were stress and time constraints.

These stakeholders were also asked questions regarding strategies for improving nutrition in SNAP participants. Changing the retail food environment was one opportunity identified by the stakeholders.63 An example of changing the retail food environment would be requiring SNAP retailers to stock certain nutrient dense foods. The stakeholders also said that enhancing nutrition education would be a good strategy for improving nutrition in SNAP participants. The participants stated
that SNAP-Ed should align nutrition information more with other federal programs and target their efforts to families with small children.

A study done in Canada by Hamelin et al.\textsuperscript{64} in 2008 examined the needs of food insecure households. The authors also investigated the effectiveness of community programs in improving food insecurity. Semi-structured interviews were conducted with stakeholders as well as food-insecure households. Both the households and stakeholders agreed that food-insecure households need more financial resources. Households reported that access to quality food was a major need that is unaddressed. The households also stated that the current programs were insufficient to meet their needs. The stakeholders, however, reported that the primary need of food insecure households was sufficient quantity of food. They also perceived the households to be satisfied with the programs.\textsuperscript{64}

Some have also investigated the perceptions of persons’ with low income in regards to the barriers they face in eating a healthy diet. Evans et al.\textsuperscript{65} in 2015 conducted focus groups in low-income ethnically diverse communities of central Texas. The participants in the focus groups reported that they had a high level of nutrition knowledge and also a high preference for nutritious foods. One barrier influencing healthful shopping behavior was the high price of healthy food. Low geographical access to healthful food was also cited as a significant barrier. Finally, they stated that the poor quality of healthy food and proximate retail stores were barriers to healthy food shopping behavior.\textsuperscript{65}
The participants in the focus groups were also asked about effective ways to increase access to healthful foods in their community. One suggested solution was placement of new supermarkets in their low-income communities. The participants also viewed farmer’s markets and community gardens as beneficial solutions. The community members did not perceive convenience store improvement strategies as effective.

Yee et al examined the barriers to nutrition therapy for diabetes management among underserved pregnant women living in Chicago. Interviews were conducted with 10 women to determine their top barriers to nutrition therapy. The first barrier was feeling overwhelmed by the unfamiliar. The second barrier was a difficulty understanding nutrition label. The women also said they found it challenging to maintain control and manage nutrition choices in their food insecure environment. Lack of control and motivation were other barriers cited. Their taste preferences and cultural norms were not always in balance with the nutrition therapy regimen. Finally, the women reported that maintaining a healthy eating schedule was a barrier to their nutrition therapy.

Another study conducted by Haynes-Maslow et al in examined the perceived barriers of fruit and vegetable consumption among low-income populations. The investigators conducted eight focus groups with 68 low-income participants in North Carolina. They identified community-level barriers to consumption of fruits and vegetables: cost, quality, and variety of the fruits and vegetables. In addition, transportation, changing food environment, and changing
societal norms on food were reported as barriers. A change in societal norms mentioned is the shift of emphasis on cooking to convenience.\textsuperscript{67}

Later in 2015, an additional study was conducted in North Carolina aimed to understand individual’s with low-income perceptions of fruit and vegetable access programs. Focus groups were conducted with 105 participants with low-income. The participants discussed that mobile markets could be successful in overcoming many barriers to eating fruits and vegetables.\textsuperscript{68} However, many worried that mobile markets would be unsafe in some neighborhoods with high crime. They had mixed opinions on whether or not food assistance programs were successful in addressing the cost barrier of accessing fruits and vegetables. Many participants stated that farmer’s markets could aid in availability of fruits and vegetables but were unsure about feasibility in their neighborhoods.\textsuperscript{68}

As stated above, one of the SNAP-Ed guiding principles is to target low-income households of women and children. However, according to Krall, et al,\textsuperscript{69} a change in household dynamics suggests that men may have an important role in food management responsibilities. The study by Krall at al\textsuperscript{69} was conducted to delineate how nutrition education programs can meet the unique needs of lower income males. Telephone interviews as well as face-to-face interviews were conducted with males with low-income living in Pennsylvania. The authors reported that 92.1% of the men prepared meals and snacks for children. In addition, 54.5% made major household food decisions. The men listed taste as a significant barrier to eating healthful food, as it is a significant factor when making food-purchasing
decisions. Two topics that they said they would like to be included in education were “which foods are best for kids” and “how to eat more healthy foods.” The investigators also asked the men about their preference of nutrition education delivery. Online delivery was the preferred method. These results indicate that it may be beneficial to consider the needs of head-of-household males while planning nutrition education.²⁹

**Needs Assessments**

A needs assessment is a planning tool used in public health and nutrition and has been defined in a number of ways. Boyle²⁰ (p.101) described needs assessments as: “the process of evaluating the health and nutrition status of a community, determining what the community's health and nutrition needs are, and identifying places where those needs are not being met.” A needs assessment is a sophisticated process that allows researchers to obtain valid information to inform their health promotion efforts.²¹

Needs assessments have been categorized in a number of ways. Stoecker²² defines needs assessments as either extensive or intensive. According to Stoecker,²² extensive needs assessments are intended to determine the broad universal needs of a population. Generally, these assessments are completed using a survey with open-ended or closed ended questions. Stoecker²² defines intensive needs assessments as taking one specific need and determine the importance of the need to the community as well as what caused the need.
According to McCawley\textsuperscript{73}, needs assessments can be categorized as direct or indirect. Direct needs assessments involve formal research with data from the clientele the researcher is interested in. This type of needs assessment results in data that is more specific to identifying needs of the individuals, but requires more resources than an indirect needs assessment. An indirect needs assessment involves gathering secondary data or data from advisors regarding their opinion on needs.\textsuperscript{73}

Needs assessments are be used in a number of settings for multiple reasons, but the overall purpose is generally the same; to obtain information about the health of a population to aid in decision-making.\textsuperscript{70} Needs assessments can be conducted for reasons such as justification for funding or for resource allocation and decision making.\textsuperscript{71} For example, The Supplemental Nutrition Assistance Program Education (SNAP-Ed) recommends the use of needs assessments to determine target populations for their programs so that their programs will result in the most significant change in nutrition and physical activity behavior. These needs assessments aid the development of evidence based SNAP-Ed programs.\textsuperscript{6}

Various authors have described the procedure of a needs assessment. The specific principles vary, but the general order of these principles are consistent. For example, Boyle\textsuperscript{70} defines these principles as: define the problem, set the parameters of assessment, collect data, analyze and interpret the data, share the findings, set priorities, and choose a plan of action. According to McCawley\textsuperscript{73}, of the University of Idaho Extension, the basic principle steps of conducting a needs assessments are as follows: write objectives, select audience, collect data, select audience sample, pick
and instrument, analyze data, follow-up. The Work Group for Community Health and Development at the University of Kansas\textsuperscript{74} describes the procedures of needs assessments involving surveys. According to the work group\textsuperscript{74}, a needs assessment starts with deciding how much time is available to do the survey. Then the researcher must decide how many people and what kind of people will be asked questions in the needs assessment. Next, the questions that will be asked must be created and the person asking the questions should be selected. A survey can then be drafted and tested. After the testing of the survey, the survey can be administered to the chosen group. Then the results must be tabulated and interpreted. Lastly, the results can be used to plan future action.\textsuperscript{74}

There is great variability in regards to the methods used for gathering information for a needs assessment. Some assessments utilize surveys for data acquisition. A survey is a method used to collect information on individual and societal feelings, values, knowledge, values, and behaviors.\textsuperscript{75} Survey questions can be open-ended or closed-ended. However, when constructing closed-ended questions, the researcher must already have somewhat of an idea of the needs of the community.\textsuperscript{70} Telephone surveys are a specific type of survey in which the survey questions are asked over the phone. Telephone surveys are becoming increasingly popular due to that fact that most people have a phone. Some advantages of phone survey is that they have high sample coverage and high response rates.\textsuperscript{76} One example of a nationwide telephone survey is the FDA Health and Diet Survey.\textsuperscript{77} It is
a periodic survey of adults in the United States that aimed at gathering information on nutrition and health to help the FDA make informed decisions.\textsuperscript{77}

The Behavioral Risk Factor Surveillance System (BRFSS) is another example of a telephone survey funded by the Center for Disease Control and Prevention.\textsuperscript{78} BRFSS is the largest continuous conducted health survey system in the world and collects health data of U.S residents. BRFSS conducts more than 400,000 interviews each year in all 50 states. Data is collected on health-related risk behaviors, chronic health conditions, and use of preventative services.\textsuperscript{78}

Other methods for data collection in needs assessments are face-to-face interviews, focus groups, and working groups.\textsuperscript{73} Face-to-face interviews involve collecting information through a conversion between two or more people in person. Since this method usually utilizes open-ended questions, the participants can express a variety of perspectives. A limitation of this technique is that there is the possibility of bias from the person conducting the interview. According to the University of Idaho Extension,\textsuperscript{73} focus groups are group discussions conducted to obtain information about perceptions and experiences on a topic from a limited number of stakeholders. This method is useful for gaining multiple perspectives on the same topic and is often utilized in the planning process of a needs assessment. Working groups involve the group process. In a working group, a facilitator leads a group through an activity. These activities can be used to “identify issues and opportunities, to build consensus, to prioritize issues or alternatives, and to assess clientele needs.”
One example of a needs assessment was conducted in 2014 in the state of Alaska. The Department of Health and Social Services commissioned the University of Alaska Fairbanks to conduct the needs assessment for the purpose of gathering data that could be used to identify which areas of the state were in most need of SNAP-Ed services. The findings were later used by Alaska’s SNAP-Ed administrators for planning purposes. Qualitative and quantitative data were collected first from existing data sources. Then, additional data was collected from a variety of experts including nutrition educators, nutrition professionals, and low-income individuals. Web-based surveys and in-depth interviews were used to obtain information from the nutrition professionals and educators. Data from the low-income individuals was obtained using a paper survey.

The investigators reported that the most prevalent dietary shortfalls among Alaskans were low vegetable and fruit intake, as well as high SSB intake. Using these results it was determined that system changes at multiple levels of the social-ecological model would have the most widespread and sustainable impact on the nutrition of SNAP participants.

Various health assessments have been conducted in Nevada in recent years. Most recently, the 2015 Nevada State Health Needs Assessment was published by Gustafson et al with funding through the Centers for Medicare and Medicaid Services. The assessment involved a survey of stakeholders and community members across the state to analyze statewide health needs. The survey was emailed to select state administrators and community members and was
additionally available online. The researchers received 300 completed surveys. One open-ended question included in the questionnaire was, “What do you think are the three (3) largest health concerns in the county you live in?” The participants listed a total of 885 health issues. The responses were sorted into 16 categories for analysis. Of the 300 participants, 220 listed a concern that related to the category of “obesity, physical activity, and nutrition.” The authors narrowed down “obesity, physical activity, and nutrition” to the following categories: obesity; nutrition, lack of education, lack of access to affordable/healthy food; physical activity; food insecurity; adolescent screen time/video games; poor lifestyle choices (lack of physical activity, tobacco use, poor nutrition, lack of exercise); food deserts; and lack of farmer’s markets. Obesity-related concerns were listed by more participants than concerns in any other category. Within the “obesity, physical activity, and nutrition” category, 120 participants cited obesity as a concern. In addition, 40 participants listed nutrition, lack or education, lack of access to affordable/healthy as one of their top three concerns.80

In 2015, the Southern Nevada Health District81 published the Clark County Community Health Assessment. Part of the assessment involved group meetings and focus groups to gather qualitative data regarding what the residents of southern Nevada perceive to be the most important aspects to their community and how well the community is doing with each important theme. During focus groups and group meetings, participants reported that the built environment was an important part of their community. However, the participants reported that the built environment of
southern Nevada was poor. The built environment included access to healthy and sustainable food.\textsuperscript{81}

An assessment was conducted in Northern Nevada as well. In 2015, the 2015-2017 Washoe County Community Health Needs Assessment was published by the Washoe County Health District and Renown Health.\textsuperscript{82} Approximately 130 people from Washoe County participated in focus groups, discussion panels, and community meetings. According to the report, participants were asked regarding health needs and key issues that must be addressed to improve the health of the community. Underserved residents (59) of the community participated in the focus groups. The focus group participants reported that they wanted access to healthy affordable food and reported that currently there was a lack of healthy and affordable food in the community. The panel discussions involved 23 persons involved in community work. These individuals reported that many residents in Washoe County are unable to obtain an adequate amount of food. Finally, the meetings included community leaders from various sectors in the community. These participants reported that the supply of “cheap/unhealthy” food as a barrier to a healthy community for Washoe County. The recent health assessments conducted in Nevada mentioned above have indicated that food security, nutrition, and physical activity are health concerns in the state of Nevada.\textsuperscript{82}

**Asset Mapping**

Needs assessments are a useful tool to identify gaps in a community where more resources are needed to serve a community. However, researchers in 1993,
proposed that it is important to look at the assets that already exist in a community as well. Kretzmann and McKnight\textsuperscript{83} first proposed the “asset-based community development” framework in 1993. They were interested in rebuilding troubled communities. Their framework was intended to improve communities by allowing researchers to recognize and map assets of the community. The assets they listed in their original description of the framework were individuals, local associations, and institutions. The authors stated in their 1993 publication that a community utilizing all of their potential assets will be most successful in the community-building process. The framework does not claim that low-income neighborhoods do not have any needs. However, it states that if all assets are mobilized, any additional resources will be more effectively utilized.\textsuperscript{83}

According to Stoecker\textsuperscript{72}, asset mapping is useful in that it allows one to learn what talents or resources are available in the community. That way, one can then determine ways to develop those talents and resources to enhance the community-building process. This involves identifying skills of individuals, organizations, as well as physical resources.\textsuperscript{72}

Boyle\textsuperscript{70} compares asset mapping to the clinical assessment of a patient. In asset mapping, the community acts as the patient. The asset mapping is a way to determine areas where the community performs well and areas that it does not. According to Boyle,\textsuperscript{70} (p. 101) the purpose of asset mapping is to “provide a better understanding of how the community functions and how it addresses the public health and nutrition needs of its citizens.” The Work Group for Community Health
and Development at the University of Kansas defines a community asset as “anything that can be used to improve the quality of community life.” According to the work group, these assets can be people, physical structures, a community service, or a business.

In 2007, a study was conducted by Baker et al. that utilized asset mapping to determine how a community in New York State could be involved in reducing television viewing time in children. The investigators worked in a local public school district in a low-income neighborhood. Asset mapping was utilized to identify individual and community strengths. The researchers first identified the key individuals, associations, institutions, and physical assets present in the community. Focus groups were also conducted to understand childcare environmental policies and practices, so that the researchers could understand how changes could be made in that environment. Lastly, the investigators held planning meetings with key stakeholders to discuss the community initiative. This study exemplifies how asset mapping may be a powerful tool used to understand how community strengths can be identified and utilized to initiate community change.

**Social-Ecological Model**

Ecology is a term that refers to the connected relationship between organisms and their environment. Ecological models focus on the environment and how it influences behavior. Gaining understanding of the environment can aid in development of effective interventions. According to Sallis and Owen, authors of...
Ecological Models of Health Behavior, multilevel approaches of ecological models have been proposed to be effective in health promotion projects.

The idea of a social-ecological model (SEM) emerged in the 1970s by Urie Bronfenbrenner. At the time, many were interested in changing individual behavior to decrease the prevalence of chronic disease. Some were focusing strictly on individual lifestyle change interventions. Soon, critics argued that targeting individual behavior was ignoring the important factor of the environment. Brofenbrenner’s model proposes that behavior is affected by multiple levels of influence. The model proposes focusing attention on social environmental factors in addition to individual factors. According to McLeroy et al, social environmental and individual factors should be targets for health promotion interventions.

The SEM demonstrates how the variety of components in society may work together to shape food and physical activity choices. Ultimately, these choices will impact one’s nutritional status and risk for chronic disease. The SEM includes five levels of influence. The first level is individual. Within this level, knowledge, attitudes, beliefs, and personality traits can influence behavior. The next level is interpersonal. The interpersonal relationships and groups such as family and peers provide an individual with social identity and a role in life. The next level of influence is institutional or organizational. This level includes worksites, schools, or religious groups. This level can be manipulated by enforcing rules, regulations, or policies. Above the organizational level is the community level. This level involves social networks, norms, and standards among individuals and groups. The last level
of influence is social structure, policy, and systems. This is the most broad level that includes local, state, and federal policies and laws.\textsuperscript{16}

The SEM proposes that utilizing multilevel interventions rather than targeting just one level is more effective in changing health behaviors. Research has suggested that utilizing multiple channels of the SEM is an effective strategy to promote and reinforce healthy nutrition behavior.\textsuperscript{16} One review published in 2008, examined the use of the SEM to improve fruit and vegetable intake among low-income African Americans.\textsuperscript{88} The 12 studies analyzed showed that the dietary behavior and fruit and vegetables intake are influenced by personal, cultural, and environmental factors. These factors can be altered by targeting the SEM levels of influence. The author concluded that the SEM is a useful tool for understanding factors and barriers that impact dietary behaviors and can be used for intervention planning.\textsuperscript{88}

The SEM is described in the 2015-2020 Dietary Guidelines For Americans.\textsuperscript{89} The Dietary Guidelines for Americans is a report created every five years and is a source of nutrition guidance public health professionals. The guidelines are developed using the most current body of scientific evidence. The most recent guidelines indicate that current evidence shows that implementing changes at multiple levels of the SEM is the most effective way to change behavior. The report explains how health professionals can use multiple levels of the model to have the most possible influence.\textsuperscript{89}
Chapter 3

Study Manuscript: Perceptions of key informants regarding the educational needs of the Supplemental Nutrition Assistance Program Education (SNAP-Ed) target audience

The following manuscript will be submitted to the Journal of Nutrition Education and Behavior.

ABSTRACT

Objective: To describe the perceptions of key informants regarding the nutrition and physical activity needs of SNAP participants and others residing in low-income communities.

Design: Semi-structured interviews with key informants.

Setting: Interviews conducted by telephone with key informants from all across the state of Nevada.

Participants: Individuals with knowledge of or experience with SNAP households and others residing in low-income communities.

Phenomenon of Interest: Nutrition and physical activity needs and potential Policy, Systems, and Environmental (PSE) approaches to stimulate behavior change.

Analysis: Qualitative analysis of interview data using electronic coding software was performed using the grounded theory approach.

Results: Key informants rated Nevada SNAP-Ed target audience’s need for education on 6 topics using a five-point scale. Mean ratings were as follows: healthy eating = 4.5 ± 0.7, healthful shopping = 4.4 ± 0.7, food resource management = 4.2 ± 0.9, food safety = 3.5 ± 1.1, physical activity = 4.0 ± 0.8, sedentary behavior = 4.2 ±
Common themes included: (1) Healthy eating, healthful shopping, and food resource management are all related; (2) Cooking at home is important; (3) Coordination with other organizations is important; (4) Environmental barriers make it difficult for Nevadans to lead a healthy lifestyle; (5) Those with limited resources or low socioeconomic status have the highest need for education on nutrition and physical activity; and (6) Let’s make the healthy choice the easy choice- we can do it!

**Conclusion and Implications:** This study provides data that can inform SNAP-Ed Programing. In addition, these results provided information on potential methods to make it easier for SNAP households and others residing in low-income community to choose healthful foods and be physically active more often.

**Key Words:** SNAP-Ed, nutrition, physical activity, low-income

**INTRODUCTION**

The Supplemental Nutrition Assistance Program (SNAP), formerly named the Food Stamp Program (FSP), is the largest food nutrition assistance program in the United States.\(^1\) In 1981, the Food Stamp Act of 1977 was amended to provide states with the option of participating in Supplemental Nutrition Assistance Program Education (SNAP-Ed).\(^5\) According to the FY 2018 SNAP-Ed Federal Guidance, the goal of SNAP-Ed is, “to improve the likelihood that persons eligible for SNAP will make healthy food choices within a limited budget and choose physically active lifestyles consistent with the current Dietary Guidelines for Americans and the USDA food guidance.”\(^6\) (p.12) The guidance\(^6\) states that SNAP-Ed programs must be
evidence-based and that states must present valid and data-driven needs assessments of nutrition, physical activity, and obesity prevention needs.

SNAP-Ed began as a program focused largely on direct-education interventions. Direct education continues to be a key characteristic of SNAP-Ed. More recently, SNAP-Ed programs have been required to also use public health approaches in combination with education to maximize impact. The latest SNAP-Ed Guidance emphasizes utilizing policy, systems, and environmental interventions. These approaches involve stimulating behavior by modifying the environment of a community that makes the healthy choice the easy and preferred choice.

This study is one component of a statewide needs assessment for Nevada’s SNAP-Ed Program. The goals of this assessment are to describe the most pressing nutrition and physical activity needs of SNAP participants in Nevada and to examine relevant community characteristics and other environmental factors that shape nutrition and physical activity behavior for the purpose of identifying opportunities for policy, system, and environmental (PSE) interventions/approaches. A steering committee was developed to help direct the assessment with the help of Nevada’s SNAP-Ed Coordinator. The eight steering committee members were selected based on their knowledge of the SNAP-Ed target audience. In addition, to serve on the steering committee, individuals needed to have experience and/or education to provide subject-matter expertise related to nutrition and physical activity. Lastly, they needed to have the time and interest to provide input at 3 different times during the assessment.
The theoretical basis for this thesis study was the Social Ecological Model (SEM). This model is also included in the 2015-2020 Dietary Guidelines for Americans. Brofenbrenner, who created the model, proposes that behavior is affected at multiple levels of influence. According to Gregson et al, the SEM involves five levels of influence including individual, interpersonal, institutional/organizational, community, and social structure, policy, and systems. Since making changes at multiple levels of the SEM has shown to be effective in changing nutrition and physical activity behavior, this study evaluated the needs of SNAP participants with this framework in mind. As stated above, the SNAP-Ed Guidance has placed a new emphasis on using PSE interventions. PSE interventions are complementary to the SEM, in that they both describe influences beyond one’s own attitudes and beliefs. The results of this study were analyzed through the lens of the SEM.

The overall purpose of this study was to describe the perceptions of key informants regarding the nutrition and physical activity needs of SNAP participants and others residing in low-income communities. For the purpose of the study, key informants were defined as “…persons who have knowledge about a community and whose opinions and insights are useful in directing a needs assessment.” Therefore, the selected individuals had useful information regarding the SNAP-Ed target audience. The objectives for this study were to describe the perceptions of key informants regarding the nutrition, food security and physical activity needs of SNAP participants and others residing in low-income communities; and opportunities at the policy, system and environmental level to facilitate healthful
nutrition and physical activity behaviors with an emphasis on low-income communities.

METHODS

Study design

This study employed a qualitative research design to investigate key informants’ perceptions of the needs of the SNAP-Ed target audience. The initial goal was to complete 25-35 interviews.

Participants and Recruitment

To begin, the research team considered the characteristics that were critical to consider to ensure a diverse sample of key informants. It was important that the informants collectively included all disciplines that relate closely to the purpose and function of SNAP-Ed (expertise and/or expertise in nutrition, food assistance, public health, public policy, medicine, dentistry, physical activity/fitness, education and/or community development). In addition, it was vital that there was representation of all of Nevada’s unique geographies (urban, rural and/or frontier areas of Nevada). Also, the collective group of informants needed to have influence at various levels (authority at one or more organizational level). Lastly, the list needed include individuals with knowledge of special populations such as specific racial/ethnic groups and older adults.

Based on these criteria, a master list of key informants was created by considering agencies or members are likely to have insights about Nevada’s SNAP-Ed target audience (n=369). The list of key informants was developed with input
from the Nevada Division of Welfare and Supportive Services, the steering committee, and members of Nevada’s Nutrition Assistance Consortium (a network of nutrition professionals in Nevada that are a part of SNAP-Ed implementing agencies). Rosters of other community-based efforts in Nevada were also referenced when creating the list. At this point in the process, some persons (such as Extension personnel) were contacted to obtain suggestions for potential key informants.

In order to consolidate the master list to the desired number of key informants, the researchers used their own personal knowledge in light of the characteristics listed above to prepare their recommendations of key informants (n=39). The list was vetted with the Nevada SNAP-Ed coordinator. This list was then sent to the steering committee with an explanation of the characteristics utilized in selecting the sample. Four members offered feedback to enhance the sample. The first suggestion was to include a school administrator. Another member suggested that additional informants with experience with older adults be included. One member suggested including Nevada Senate and Assembly health committee members. The final suggestion was to include more individuals with a lower level of influence (work directly with SNAP households and others residing in low-income households). As a result of this step, the list expanded to 44 individuals.

To begin recruitment, a letter (Appendix A) was sent to the selected key informants explaining the purpose of the needs assessment and inviting them to take part in the telephone interview. Follow-up telephone calls to schedule interviews were made by a research team member approximately one week after
the initial letters were sent. A script was used for this purpose (Appendix B). After a time was confirmed, a follow-up email was sent (Appendix C). The email confirmed the date and time of the interview and also had the information sheet (Appendix D) and definition sheet (Appendix E) attached. The information sheet described the study and served as a consent form. The definition sheet contained the definitions of the SNAP-Ed target audience, the goal of SNAP-Ed, healthy eating, healthful shopping, food resource management, food safety, physical activity, and sedentary behavior. These definitions cited from the SNAP-Ed Guidance and the SNAP-Ed Evaluation Framework. These definitions were provided as a means of clarifying the questions. The definition sheet also had a visual of the five point rating scale for the use during the interview.

**Study Procedures**

Telephone interviews were conducted using a semi-structured interview guide (Appendix F). The interview guide was developed with the purpose of obtaining the perceptions of key informants in regards to nutrition and physical activity education needs as well as barriers to making behavior changes among SNAP households and others residing in low-income households. The interview guide was pretested prior with three nutrition professionals, not from the sample of this study. From the pretest interviews, minor changes were made to the interview guide.

The Office of Research Integrity of the University of Nevada, Reno approved the study protocol with an expedited review (Appendix G). As stated above, the
participants were sent an Information Sheet (Appendix D), which served as a consent form in this study.

During the interview, the moderator followed the interview guide (Appendix F). The participants were informed that they could skip any question if they did not know the answer or had no opinion. The participants could also refuse to answer any question.

The telephone interviews lasted about twenty to thirty minutes. Initially, they were asked to rate the need for education on a scale from 1-5 regarding the categories of healthy eating, healthful shopping, food resource management, food safety, physical activity, and sedentary behavior. One corresponded to “a low level of need” and five corresponded to “a high level of need.” They were also told that they could answer with a “0” if they didn’t know or had no opinion. Following each rating, they were asked if there was a particular topic related to each category that they perceived as more important than others.

Next, key informants were asked how the need for education was different among specific special populations. The special populations included in this set of questions were: urban, rural, and frontier communities; racial/ethnic groups; older adults; disabled; and veterans. Then they were asked, what population or group in Nevada, in their opinion, was in the greatest need for education on nutrition and physical activity.

The final questions of the interview guide focused on PSE interventions. As stated above, the SNAP-Ed plan guidance emphasizes the use of PSE interventions in
SNAP-Ed plans. Therefore, an entire section of the interview guide was dedicated to this topic. The key informants were asked, "in your opinion, how could Nevada's SNAP-Ed program make it easier for the population mentioned in the special population portion of interview to choose healthful foods more often?" The same question was asked in regards to physical activity.

**Study Protocol**

Telephone interviews were conducted in a secure office at the University of Nevada, Reno. All interviews were audio recorded, and verbal consent was given by each participant at the beginning of the interview.

**Data Analysis**

All audio recordings of the interviews were transcribed verbatim by a third party. One of the research team members compared four of the recordings to the transcripts and made note of any discrepancies. Only minor discrepancies were noted.

A member of the research team then coded and analyzed the transcripts using the grounded theory approach. NVivo computer software was utilized for the qualitative data analysis. There are four major types of coding within grounded theory analysis: 1) open coding, 2) axial coding, and 3) selective coding. Strauss and Corbin describe open coding as the process of naming and categorizing themes after examination of data. Once these categories are developed, the second phase of coding (axial) can begin. Axial coding involves finding connections between categories that were identified in the first coding phase. The selective stage of
coding involves creating a story from the categories developed as well as the connections made between the categories that explain the experiences of the participants.\textsuperscript{91}

Intercoder agreement was used in this study to establish reliability of the coding process.\textsuperscript{92} After the first coder finished all of the coding, a second member of the research team coded all of the data from nine of the transcripts. Then, using NVivo, it was determined if the data points were assigned to the same nodes based on the codebook definitions. If the same node was assigned to the categories given by each coder, then the node was a “yes” and if it is not then the node was a “no.” The percentage of agreement was calculated by dividing the total number of “yes” nodes by the total number of “no” nodes. The coder agreement average from all sections was 72.0\% (with the lowest section agreement being 60.5\% and the highest being 88.3\%). One section in particular had low agreement compared to others, so the first coder went back and recoded that section. A new research team member coded this section, resulting in a total coder agreement of 83.6\%, which is deemed adequate for intercoder reliability.\textsuperscript{92}

**RESULTS**

*Participant recruitment and characteristics*

Of the 44 potential participants, 35 participated in a telephone interview. Two of the key informants had a representative from their respective organizations participate in the interview, rather than themselves. The research team was unable to reach six of the potential participants after multiple attempts and four potential
participants declined to participate. After reviewing the list of participants, the research team noted that representation was limited from those with a high-level of influence among rural areas of the state. Therefore, additional letters were sent to four rural county officials. One of these officials agreed to participate in the study, while the other three were unable to be reached.

The participants were first asked questions about themselves. Key informants (n=35) had been at their current position for an average of 9.8 years (± 9.1 years). The participants reported living in Nevada for an average of 25.9 years (± 9.1 years). Out of the 35 participants, 0 (0 %) reported never having face-to-face interaction with persons residing in low-income communities; 8 (23%) rarely; 9 (26%) sometimes, and 18 (51%) regularly.

Rating of Needs

On a scale from 1 to 5, key informants rated the need for education on 6 topics among Nevada’s SNAP-Ed audience. Mean ratings were as follows: healthy eating = 4.5 ± 0.7, healthful shopping = 4.4 ± 0.7, food resource management = 4.2 ± 0.9, food safety = 3.5 ± 1.1, physical activity = 4.0 ± 0.8, sedentary behavior = 4.2 ± 0.8.

The remaining portion of the interview gathered qualitative data regarding the informants’ perception of the needs and opportunities for SNAP households and others residing in low-income households. The most common themes arising from the interviews are discussed below.
Healthy eating, healthful shopping, and food resource management are all closely related.

The first section of the interview guide involved questions about the needs of the SNAP-Ed target audience in regards to healthy eating, healthful shopping, food resource management, food safety, physical activity, and sedentary behavior. The responses from the key informants for the first three categories often overlapped (Table 1). For example, the topics of cooking, determining nutrient density, and the link between nutrition and health were each mentioned in more than one of these categories. In addition, some key informants mentioned topics in respect to food resource management in the preceding healthy eating and healthful shopping sections; communicating that these topics were related. Therefore, the key informants reported that these topics are interconnected; healthy eating requires healthful shopping. In addition, to be able to successfully shop healthfully with limited resources, it is necessary to have knowledge about effective food resource management.

Cooking at home is important

Another emerging theme was the importance of cooking. The key informants reported that education on healthy cooking should be a priority for SNAP-Ed. Cooking was mentioned as an important topic during the discussion about healthy eating, healthful shopping, and food resource management (Table 1). Then, in the portion of the interview discussing urban, rural, and frontier special populations, one key informant reported:
“One of the things that we need is opportunities to provide cooking demonstrations for SNAP recipients. You know getting back to the idea of cooking is a huge piece of how we’re going to make SNAP-Ed successful because food that you cook yourself is much less expensive than foods you purchase but yet, unfortunately, the Millennials, Gen-X, even Baby Boomers, we’ve been more engaged in work and in home and so we’re not used to cooking and so those community kitchens being available where you can teach cooking are easier to find in urban than in rural and in the frontier as well.”

In addition, cooking was mentioned again by key informants in response to questions on specific racial/ethnic groups and older adults (Table 2). In the last section of the interview on PSE interventions, one key informant mentioned cooking classes as a component of a potential mentoring program:

“But having some kind of mentorship program that would help these families get into a routine of doing it. It has to be more than just sending literature and having somebody talking to somebody. It could be cooking classes where people can try the food.”

Coordination with other organizations

Another emerging theme from the key informants was the importance of coordination with other organizations. The SNAP-Ed guidance discusses the
importance of states consulting and coordinating with other Food and Nutrition Service (FNS) programs. However, the key informants reported the possible value of coordination with other organizations, schools, and fitness facilities. This idea was first mentioned in the special populations portion of the interview. Key informants reported that it would be beneficial to partner with organizations that already work with “hard to reach” populations such as older adults and those who are disabled (Table 2). Two key informants mentioned this idea:

“I think we need to reach out more to people who are isolated but a lot of people are getting out every day especially the folks that I worked with physical disabilities. So if they’re coming out for something else and being a part of that. So it could be like partnering with the centers for independent living when they activities or discussion on nutrition and physical activity. Trying to partner to reach those populations.”

“Wow, that is really hard because I guess, first that would require their strong integration with organizations that are serving people with disabilities.”

During discussion about PSE interventions, key informants mentioned the importance of coordinating with schools, grocery stores, and other organizations (Table 4). Key informants reported that partnering with schools would allow for large reach to children and would instill important nutrition and physical activity information among children at a young age. In addition, the key informants reported
that coordinating with grocery stores could be beneficial. One key informant mentioned the idea of implementing signage in grocery stores indicating recommended SNAP items. This informant also suggested having recipes near food items in the store. Lastly, the idea of partnering with other community organizations was mentioned:

“One thing you mentioned about working with public organizations, and I realize that there’s not a large amount of community health centers in Nevada, but, perhaps, partnering with community health centers to provide education. There may be certain opportunities with certain senior organizations or programs throughout the state that you may be able to disperse information or nutritional information to seniors. Possibly partnering with AARP in states. The Division for Aging Services at the state level might be another group to partner with to provide that information. I think those are just a couple of examples.”

In regard to physical activity, key informants reported that partnering with facilities to increase opportunities for the SNAP-Ed audience to participate in physical activity could be beneficial (Table 4). One key informant suggested asking for discounted rates for the low-income families.

*Environmental barriers make it difficult for Nevadans to live a healthy lifestyle*
In regards to PSE, environmental barriers were mentioned by key informant prior to this section (Table 1). For example, in the healthful shopping section of the interview guide, a key informant reported barriers to shopping healthfully:

"I think one of the challenges that I have with this approach is its putting all of the responsibility for obesity and being unhealthy on the low-income families living in these neighborhoods when part of the responsibility is environmental and that we develop communities where healthy food is readily available."

During discussion about sedentary behavior, barriers were also mentioned. One informant reported that many kids are left at home with electronics, due to lack of affordable childcare and unsafe neighborhoods (Table 1). Another mentioned lack of affordable and accessible options for physical activity. The sentiment from the key informants was that direct education is not enough and that there are barriers that exist that keep the SNAP-Ed audience from making healthy choices.

When asked about unique aspects of urban, rural and frontier communities, key informants mentioned environmental barriers (Table 2). Key informants said that many urban neighborhoods are unsafe, which prevents people from engaging in physical activity outside. They also said that transportation can be an issue in urban areas, because those with low income may not have a car or may not live near public transportation. One key informant mentioned that many urban neighborhoods may have a store near them with food, but many times these are convenience stores,
rather than full service grocery stores. In regards to the rural areas, key informants reported that the communities lack various resources such as a store to buy healthy food or a gym to use for physical activity.

*Those with limited resources or low socioeconomic status have the highest needs for education on nutrition and physical activity*

At the conclusion of the discussion on special populations, the informants were asked what population or group in Nevada did they perceive had the highest need for education on nutrition and physical activity. Many reported that those with limited resources or low socioeconomic status were in the greatest need. Common answers under this category were “low-income families”, “low socioeconomic status”, and “those with lower levels of education.” Specific racial/ethnic groups were also a common answer. African American, Hispanic, and Native American populations were mentioned. The senior population was also a group that was mentioned by multiple key informants. Finally, informants reported that children and adolescents also have a high need for education on nutrition and physical activity.

*Let’s make the healthy choice the easy choice- we can do it!*

The key informants came across as enthusiastic and positive regarding ideas to make it easier for those with low-income to make healthier choices. When asked about making it easier to choose healthful foods more often, the key informants mentioned improving environment and access (Table 4). Some ways to do this were making healthy foods less expensive, making sure local bus routes go to grocery
stores, improving jobs and housing, creating a program to provide SNAP-Ed households with produce on a weekly basis, and making sure SNAP-Ed programs are occurring at convenient locations (Table 4). Other key informants stated that outreach to the community should be a priority:

“I think that some of the avenues that we attempt to reach...to get parents to fill out free and reduced applications for meals and we, um, try to reach them through community outreach, whether it would be, like, meeting them at a swap meet or places where that certain demographic would be, um...I think of that and try to reach them in the community rather than having to make them take the time out to come see you.”

Other ideas mentioned repeatedly were imposing SNAP purchasing restrictions, offering incentives to participate in education, placing nutrition education signage in stores, and partnering with stores (Table 4).

In the portion of the interview discussing ways to make it easier for SNAP households and others residing in low-income households to be physically active more often, the key informants mentioned the importance of enhancing the environment (Table 4). They reported that transportation, unsafe neighborhoods, childcare options should be improved. The key informants also reported the importance of educating the SNAP-Ed audience on ways to integrate physical activity into daily life:
“Telling people how to integrate it into their lives. Park towards the back so at least you’re walking. Simple things. It can’t become a burden. It has to be able to be incorporated into their own daily life.”

Other common topics mentioned were partnering with schools and daycares, increasing access and opportunity for physical activity in the community, and social media and campaigns (Table 4).

Table 1
Nutrition and physical activity topics described as important by the key informants during semi-structured telephone interviews

<table>
<thead>
<tr>
<th>Topics</th>
<th>Findings</th>
<th>Representative Quotes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Healthy Eating</td>
<td>Choose MyPlate</td>
<td>&quot;Choosing a variety of foods, like including fruits and vegetables, and grains, which are part of MyPlate guidelines is really important.&quot;</td>
</tr>
<tr>
<td></td>
<td>Healthy eating on a budget</td>
<td></td>
</tr>
<tr>
<td></td>
<td>How to cook healthy meals</td>
<td></td>
</tr>
<tr>
<td>Variety</td>
<td>The link between nutrition and health</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Portion size</td>
<td>&quot;How to stretch your dollars to get things that are healthy to eat. How to maximize your money to be able to buy healthy items.&quot;</td>
</tr>
<tr>
<td></td>
<td>How to use nutrition facts panel and ingredient lists</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Small meals throughout the day</td>
<td></td>
</tr>
<tr>
<td>Healthful shopping</td>
<td>Stretching food budget to purchase healthy foods</td>
<td>&quot;I don’t even know the answer to this, but how on a tight budget do you pick the healthiest foods necessary to meet the requirements? And, at the same time, not let your children walk away feeling hungry.&quot;</td>
</tr>
<tr>
<td></td>
<td>How to use the nutrition facts panel and ingredient lists</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Nutrient density</td>
<td></td>
</tr>
</tbody>
</table>
|                               | How to cook healthy food that is purchased                               | "I think one of the challenges that I have with this approach is its putting all of the responsibility for obesity and being unhealthy on the low-income families living in these neighborhoods when part of the responsibility is
<table>
<thead>
<tr>
<th>Food resource management</th>
<th>How to apply knowledge in daily life environmental and that we develop communities where healthy food is readily available.</th>
<th>How to make food last the entire month</th>
<th>&quot;Strategies to use to spread the food throughout the month so that they're not running low between paychecks throughout the month.&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food assistance resources (identification/strategic utilization)</td>
<td>The link between nutrition and health</td>
<td>Food assistance resources (identification/strategic utilization)</td>
<td>&quot;Utilizing those resources like what to use your SNAP dollars on, what to use your discretionary, what you should use for your WIC, when to go to the food pantry.&quot;</td>
</tr>
<tr>
<td>How to cook and prepare foods in a healthy way</td>
<td>Getting the most nutrient dense foods on a limited budget</td>
<td>How to cook and prepare foods in a healthy way</td>
<td>&quot;...explain to them like canned goods are good for after they expire – kind of give them some education on expiration dates – on how the products are still good and still consumable even though they've expired.&quot;</td>
</tr>
<tr>
<td>Access to healthy food in low-income neighborhoods</td>
<td>Access to healthy food in low-income neighborhoods</td>
<td>Getting the most nutrient dense foods on a limited budget</td>
<td>&quot;Not necessarily needing to go to the gym but you can just add things to your daily routine that would enhance the physical activity throughout the day.&quot;</td>
</tr>
<tr>
<td>Food safety</td>
<td>Food preparation and storage</td>
<td>Food preparation and storage</td>
<td>&quot;I'm going to say that its more about getting up and doing it. I think people hear things about what they should be doing but actually getting them to follow a regime.&quot;</td>
</tr>
<tr>
<td>Washing hands</td>
<td>Washing hands</td>
<td>Washing hands</td>
<td>&quot;Limiting screen time. TVs, tablets, iPhones, iPads, anything like that.&quot;</td>
</tr>
<tr>
<td>Appropriate use of expiration dates</td>
<td>Appropriate use of expiration dates</td>
<td>Appropriate use of expiration dates</td>
<td>&quot;Breaking up sedentary behavior. It's inevitable that we're going to be</td>
</tr>
<tr>
<td>Physical Activity</td>
<td>Easy ways to engage in physical activity throughout the day (without a gym)</td>
<td>Easy ways to engage in physical activity throughout the day (without a gym)</td>
<td></td>
</tr>
<tr>
<td>How to balance cardiovascular fitness, muscle strength, and flexibility</td>
<td>How to balance cardiovascular fitness, muscle strength, and flexibility</td>
<td>How to balance cardiovascular fitness, muscle strength, and flexibility</td>
<td></td>
</tr>
<tr>
<td>Taking the opportunity to be active-&quot;just do it!&quot;</td>
<td>Taking the opportunity to be active-&quot;just do it!&quot;</td>
<td>Taking the opportunity to be active-&quot;just do it!&quot;</td>
<td></td>
</tr>
<tr>
<td>Education on affordable and accessible opportunities</td>
<td>Education on affordable and accessible opportunities</td>
<td>Education on affordable and accessible opportunities</td>
<td></td>
</tr>
<tr>
<td>Education to parents on the importance of children being physically active</td>
<td>Education to parents on the importance of children being physically active</td>
<td>Education to parents on the importance of children being physically active</td>
<td></td>
</tr>
<tr>
<td>Education on how to advocate for more opportunities</td>
<td>Education on how to advocate for more opportunities</td>
<td>Education on how to advocate for more opportunities</td>
<td></td>
</tr>
<tr>
<td>The link between physical activity and health</td>
<td>The link between physical activity and health</td>
<td>The link between physical activity and health</td>
<td></td>
</tr>
<tr>
<td>Sedentary Behavior</td>
<td>Screen time limits</td>
<td>Screen time limits</td>
<td></td>
</tr>
<tr>
<td>Replacing sedentary behavior with physical activity</td>
<td>Replacing sedentary behavior with physical activity</td>
<td>Replacing sedentary behavior with physical activity</td>
<td></td>
</tr>
</tbody>
</table>
Definition of sedentary behavior and how it is linked to health

Lack of accessible and affordable physical activity opportunities

Environmental barriers to being physically active (unsafe neighborhoods, lack of affordable childcare)

Breaking up sedentary behavior

Targeting children

Table 2
*Unique needs for education on nutrition and physical activity for special populations as described by the key informants during semi-structured telephone interviews*

<table>
<thead>
<tr>
<th>Special Population</th>
<th>Findings</th>
<th>Representative Quotes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban, Rural, and Frontier</td>
<td>Less access to resources in rural and frontier communities</td>
<td>“I think that the rural and frontier communities have less access to a wide variety of foods as well as foods of high nutritional value compared to those who are in more urban settings or locations.”</td>
</tr>
<tr>
<td></td>
<td>Outreach to rural and frontier necessary</td>
<td>“In urban areas, if it's a high crime neighborhood, there is the safety issue and people tend not to go because of concerns for physical safety.”</td>
</tr>
<tr>
<td></td>
<td>Environmental barriers in urban areas (unsafe neighborhoods, lack of transportation, food deserts)</td>
<td>&quot;Yes, the scope of activity may be different, because, you know, depending if they live in a place that has sidewalks or parks.&quot;</td>
</tr>
<tr>
<td></td>
<td>Different scopes of activity due to the unique environment</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Educate the parents in addition to children to stimulate behavior change</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Needs differ by school district</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Rural and frontier communities get more one on one education</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Urban communities need education on opportunities that exist</td>
<td></td>
</tr>
<tr>
<td>Racial/ethnic groups</td>
<td>Education needs to be tailored to culture, traditions, and customs</td>
<td></td>
</tr>
<tr>
<td>----------------------</td>
<td>---------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>Education needs to be translated to appropriate languages</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Differs by socioeconomic status, not by race/ethnicity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emphasis on Hispanic, African American, and Native American populations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Educate based on which medical conditions certain groups are prone to</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education on healthy cooking methods</td>
<td></td>
<td></td>
</tr>
<tr>
<td>There are not enough racially diverse leaders in nutrition and physical activity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&quot;I think that education needs to take into consideration cultural difference to reach those populations. And their kind of family traditions and yeah, I think that it should be targeted or tailored to specific populations.&quot;</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| Older Adults | "I definitely think the education for different ethnic groups in what they might be more prone to. So, African Americans are more prone to heart disease and high blood pressure, so educating them on what foods they can eat for their specific condition. But their needs might be different from the needs of another community." |
| Education must be tailored to physical Impairments |
| The environment and possible isolation need to be considered |
| Fixed-income |
| Raised in a different era, they need re-education |
| Difficult to get them enrolled in assistance programs |
| Education on physical activity opportunities |
| Ideas for healthy convenient meals |
| Lack of technology use |
| Nutrient density |
| "We need more people to be in the health and nutrition field to reflect the populations that need it most. And we don’t have enough." |

<p>| &quot;They have sensory issues, they can have mechanical swallowing issues, depression, so, you know just trying to maintain that nutrition status on the foods that they can eat.&quot; |
| &quot;It could be like partnering with the centers for independent living with activities or discussions on nutrition and physical activity. Trying to partner to reach those populations.&quot; |
| Partner with organizations that work with older adults |</p>
<table>
<thead>
<tr>
<th>Disabled</th>
<th>Tailored classes or webinars on issues that older adults face</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Customizing education for their disability</td>
</tr>
<tr>
<td></td>
<td>Less access and possible isolation</td>
</tr>
<tr>
<td></td>
<td>Partnering with groups that work with the disabled</td>
</tr>
<tr>
<td></td>
<td>It is difficult for parents to follow through with education</td>
</tr>
<tr>
<td></td>
<td>Disabled understand their conditions well and are well educated</td>
</tr>
<tr>
<td></td>
<td>The caregiver needs to be educated</td>
</tr>
<tr>
<td></td>
<td>Higher need in general</td>
</tr>
<tr>
<td></td>
<td>No difference, they are well supported</td>
</tr>
<tr>
<td></td>
<td>Depends on physical limitations or injuries</td>
</tr>
<tr>
<td></td>
<td>Connect them to the services available to them</td>
</tr>
<tr>
<td></td>
<td>Fixed-income</td>
</tr>
<tr>
<td></td>
<td>Mental health</td>
</tr>
<tr>
<td></td>
<td>Partner with other organizations already working with veterans</td>
</tr>
<tr>
<td></td>
<td>Leverage the nutrition habits present in the military</td>
</tr>
<tr>
<td></td>
<td>It is necessary to consider the different ages of veterans</td>
</tr>
</tbody>
</table>

"For the disabled population you frequently have to customize that physical activity to what they're capable of doing and look for accommodation to address their disability."

"...would require their strong integration with organizations that are serving people with disabilities."

<table>
<thead>
<tr>
<th>Veterans</th>
<th>&quot;I think we have a very strong veteran support system here. I know that we do where I am employed. So I do not feel like they’re isolated.&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&quot;Well, I think there you get into injuries and disabilities. People with mental illnesses or post-traumatic stress disorder may have trouble shopping or managing money.&quot;</td>
</tr>
</tbody>
</table>

Table 3
*Ideas for appropriate policy systems and environmental interventions as described by the key informants during semi-structured telephone interviews*
<table>
<thead>
<tr>
<th>Topics</th>
<th>Findings</th>
<th>Representative Quotes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Healthy Eating</td>
<td>Improve environment and access</td>
<td>&quot;They can have the education but if they don’t have the resources and the self-efficacy and an environment that supports making those healthy choices, um, the education isn’t enough. So, I think, um...an environment that allows for them to access food—whether that is, you know, bus routes along...that go by grocery stores, access to healthy foods which isn’t always available within walking distance or always available in large quality in a convenient store.”</td>
</tr>
<tr>
<td></td>
<td>Outreach to the community</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SNAP purchase restrictions</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Incentives to participate in education</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Signage in stores, partnering with stores</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Incentives to buy fruits and vegetables</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Partner with other organizations and schools</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Educate on healthy eating on a budget</td>
<td>&quot;For example, I go to Raley’s and they have the food ratings for food relating to health and the nutritional content. But yeah, something along that order. Where you would actually have things labeled on the shelf for Snap participants to choose.”</td>
</tr>
<tr>
<td></td>
<td>Educate employers</td>
<td></td>
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<tr>
<td></td>
<td>Education on growing food</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Increase SNAP benefit rate</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mentoring program</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Social media</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Translated education information</td>
<td></td>
</tr>
<tr>
<td>Physical activity</td>
<td>Enhancing environment (transportation, safe neighborhoods, childcare)</td>
<td>&quot;More opportunity in the community for free activity. Like walking trails, um, or pathways, outdoor fitness courses. Things that don’t cost money like a gym membership or something like that.”</td>
</tr>
<tr>
<td></td>
<td>Education on integrating physical activity into daily life</td>
<td>&quot;Collaborating with providers, and other community based organizations that may have some reach in their homes. Like Meals on Wheels, things like that. Where people are</td>
</tr>
<tr>
<td></td>
<td>Partner with schools and daycares</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Increase access and opportunities for physical activity in the community</td>
<td></td>
</tr>
</tbody>
</table>
DISCUSSION

The results of this study indicated that, according to key informants, SNAP households and others residing in low-income communities have a high need for education on nutrition and physical activity. This is consistent with findings from other recent health assessments conducted in Nevada. The 2015 Nevada State Health Needs Assessment, published by Gustafson et al., involved a survey of stakeholders and community members across the state to analyze statewide health needs. The survey was emailed to select state administrators and community members and was additionally available online. One open-ended question included in the questionnaire was, “What do you think are the three largest health concerns in the county you live in?” The participants listed a total of 885 health issues. The responses were sorted into 16 categories for analysis. Of the 300 participants, 220 listed a concern that related to the category of “obesity, physical activity, and
nutrition.” Obesity-related concerns were listed by more participants than concerns in any other category. The authors identified more specific categories. Within the “obesity, physical activity, and nutrition” category, 120 participants cited obesity as a concern. In addition, 40 participants listed nutrition, lack or education, lack of access to affordable/healthy as one of their top 3 concerns. This previously conducted health assessment and this current study indicate that nutrition and physical activity education should be a priority in Nevada.

National data also points to a need for education on obesity prevention. According to the CDC, 36.5% of adults from 2011-2014 were obese. In the same timeframe, 17.0% of children were obese. The national data reinforces the results from this study and the conclusion that more education on nutrition and physical activity would benefit American communities.

As mentioned above, the key informants communicated the importance of educating the SNAP-Ed audience on healthy cooking. In 2016, Garcia et al analyzed the effect of cooking skill interventions on confidence and eating behavior in a review article. They reported that cooking programs increased confidence in cooking skills across age groups. The results regarding modification of eating behavior were mixed. However, small increases in consumption of fruits and vegetables were reported. Overall, the study indicated that education on cooking can increase confidence as well as fruit and vegetable consumption. This is consistent with the data from our key informants, indicating that health cooking education can potentially benefit the SNAP-Ed target audience.
Key informants indicated that barriers exist that prevent SNAP households and others residing in low-income communities from making healthful choices such as a lack of resources and access to full service grocery stores. Other studies have investigated the opinions of experts or stakeholders regarding these barriers. One study by Leung et al.\textsuperscript{61} conducted in 2013 reported the following barriers to eating a healthy diet: the high cost of nutrient-rich food, inadequate SNAP benefits to purchase this food, limited access to healthy foods, and environmental factors associated with poverty. Some of the environmental factors mentioned were lack of supermarkets in low-income neighborhoods, the absence of nutrient-rich food in convenient stores, and the inability to use SNAP benefits at farmer’s markets.\textsuperscript{61} These results coincide with results from the key informants regarding the existence of environmental barriers.

Participants in the study by Leung et al.\textsuperscript{61} were also asked what they thought would be effective strategies to improve the nutrition of SNAP participants. The participants mentioned the following strategies: providing financial incentives for purchasing healthy food, restricting the purchase of nutrient poor foods using SNAP benefits, changing the frequency of benefit distribution, enhancing nutrition education (such as allowing for more flexible education formats and a wider range of topic coverage), improving the SNAP retailer environment, and increasing coordination of state and federal assistance.\textsuperscript{61} The authors’ results overlapped with the findings from the key informants in this study. The informants mentioned the potential use of incentives and purchasing restrictions as a way to facilitate
healthful nutrition. In addition, the key informants mentioned coordination with grocery stores and other organizations.

Another study done in 2014 by Blumenthal et al. also assessed the opinions of stakeholders in regards to SNAP participants’ barriers to eating healthy as well as strategies for improving dietary quality. The high level of marketing in low-income communities of unhealthy foods, the high cost of healthy foods, and lifestyle challenges were frequently mentioned barriers. Lifestyle challenges that they identified as prevalent for low-income individuals were stress and time constraints. The informants in this study also mentioned the high cost of healthy foods as a barrier and the need of education on food resource management. Informants also mentioned time lifestyle challenges as a barrier to healthy eating and physical activity. For example, one informant mentioned the issue of working families and inadequate childcare.

These stakeholders were also asked about ways to improve nutrition among SNAP participants. Changing the retail food environment was one opportunity identified by the stakeholders. An example would be requiring SNAP retailers to stock certain nutrient-dense foods. The results from this study also indicated that the retail environment should be altered.

The stakeholders also said that nutrition education should be enhanced and that SNAP-Ed should align nutrition information more with other federal programs and target their efforts to families with small children. Additionally, key informants mentioned coordination with other programs and frequently mentioned
children in regards to what population in Nevada is in the highest need for education.

LIMITATIONS

One limitation of this qualitative study was that the small sample was purposively selected with the goal of having a representative group of key informants. Therefore, the results of this study cannot be generalized. Another limitation was the necessity of conducting the interviews by telephone. Compared to in-person interviews, one loses visual communication cues. Finally, the interviews only captured the perspectives of the key informants, rather than the SNAP participants themselves.

IMPLICATION FOR RESEARCH AND PRACTICE

This study provides information that can inform SNAP-Ed programs in Nevada and states with similar demographics. The results suggest that educating on healthy eating, healthful shopping, and food resource management may best done in conjunction, since they are interrelated. The study findings also reaffirm the importance of educating families on how to cook at home.

Lastly, the current SNAP-Ed guidance emphasizes the use of PSE interventions. This study provided information on potential methods to make it easier for SNAP households and others living in low-income communities to choose healthy foods and be physically active more often.
Conducting a quantitative study with a large representative sample of stakeholders would provide generalizable results regarding the perceived needs of SNAP households and others residing in low-income communities.

**ACKNOWLEDGMENTS**

This study was funded by USDA’s Supplemental Nutrition Assistance Program (SNAP). The authors thank the Nevada SNAP-Ed coordinator, the steering committee, and the key informants who participated in the telephone interviews.
Chapter 4

Conclusions

The purpose of this thesis study was to describe the perceptions of key informants regarding the nutrition and physical activity needs of SNAP participants and others residing in low-income communities. The results will be used by the Nevada Division of Welfare and Supportive Services to determine priorities and strategies for Nevada’s SNAP-Ed Plans. Semi-structured telephone interviews were conducted with key informants who had knowledge of or experience with SNAP households and others living in low-income communities. The following research objectives guided this thesis study:

1. To describe the perceptions of key informants regarding the nutrition, food security and physical activity needs of SNAP participants and others residing in low-income communities.

2. To describe the perceptions of key informants regarding opportunities at the policy, system and environmental level to facilitate healthful nutrition and physical activity behaviors with an emphasis on low-income communities.

This chapter describes the context of this research study as well as what how the results can be applied in Nevada. Lastly, recommendations for future research are provided.
As stated above, this study was a component of a statewide needs assessment for Nevada’s SNAP-Ed Program. The first phase of the assessment (gathering and summarizing existing data to characterize Nevada SNAP participants and low-income communities) has been completed. This study fulfilled phase two (key informant interviews) of the assessment. The results from the first two phases will help inform the development of phase three of the assessment (telephone surveys of SNAP households).

**Application in Nevada**

The results of this study can be used to inform SNAP-Ed programs in Nevada. First, the key informants rated a high level of need in regards to the topics of healthy eating, healthful shopping, food resource management, food safety, physical activity, and sedentary behavior. In addition, the they indicated that healthy eating, healthful shopping, and food resource management are interrelated and it is difficult to disentangle them. Key informants also reported that teaching SNAP households and others residing in low-income communities how to cook is very important.

Key informants reported that those who are in highest need of education on nutrition and physical activity are those with limited resources or low socioeconomic status. Finally, the key informants communicated their enthusiasm towards the idea of using PSE interventions to make it easier for SNAP households and others residing in low-income communities to choose healthy foods and be physically active more often. All of the results described can be utilized to design effective SNAP-Ed programs.
Future research

This study demonstrated the importance of investigating the education needs of SNAP households and others residing in low-income communities. Further research must be done to understand these needs from the perspective of the SNAP households themselves. A study with this objective will be completed by the research team in the coming year. In addition, a potential follow-up study could involve obtaining quantitative data from a large representative sample of health professionals on the topic of the needs of SNAP households and other residing in low-income communities.
References


59. *Impact: All 4 Kids: Healthy, Happy, Active, Fit.* University of Nevada Cooperative Extension.


Clark County Community Health Assessment. Southern Nevada Health District; 2015.


Appendix A  
Letter of Invitation

Date
Name
Address

Dear ______,

We are writing to invite you to participate in a research study to obtain your opinions about the needs of low-income households in Nevada. Thank you for considering this invitation.

This research study is a part of a statewide needs assessment for Nevada’s Supplemental Nutrition Assistance Education Program (SNAP-Ed). The goal of SNAP-Ed is, "to improve the likelihood that persons eligible for SNAP will make healthy food choices within a limited budget and choose physically active lifestyles consistent with the current 2015-2020 Dietary Guidelines for Americans and the USDA food guidance.” The findings of the assessment will be used to strengthen Nevada’s SNAP-Ed Plan by modifying programs and approaches, or developing new programs as/if indicated.

You are among a group of forty professionals that have been identified as having knowledge about households and communities that may be served by SNAP-Ed efforts. To benefit from your expertise, we would like to ask you to participate in a telephone interview. The purpose of the interview is to obtain your opinions about the nutrition education needs of SNAP-Ed audiences and opportunities to positively impact the nutritional health of residents in low-income communities. The telephone interview will be scheduled at your convenience and will last no longer than 30 minutes.

To discuss this invitation further, you will be contacted by telephone in the coming week. If you do not wish to hear from us, please let us know by calling 775-784-6445 or sending an e-mail to jamieb@cabnr.unr.edu.

Thank you in advance for considering this invitation.

Sincerely,
Jamie Benedict, Ph.D., R.D., L.D.  
Megan Schwartz

Associate Professor  
Nutrition Graduate Student
Appendix B
Scheduling Phone Call Script

“Good afternoon (key informant’s name). My name is Megan Schwartz and I am a Nutrition Graduate Student working with Dr. Jamie Benedict on a statewide needs assessment for Nevada’s Supplemental Nutrition Assistance Education Program (aka, SNAP-Ed). The reason for this call is to follow up on the letter we sent you a few days ago. Do you recall receiving this letter?”

If “Yes” Response: “That’s great! Well, as you know, we are assisting with a statewide needs assessment that will be used to guide Nevada’s SNAP-Ed efforts in the future. Because you are knowledgeable about the audiences and communities served by SNAP-Ed, your opinions and insights would be helpful. I am calling to personally invite you to participate in the research study. The purpose of the study is to obtain the opinions and insights of professionals regarding the nutrition education needs of the SNAP-Ed audience and opportunities to positively impact the nutritional health of residents in low-income communities throughout the state of Nevada.”

If “No” Response: “Okay, that’s not a problem. I will go ahead and summarize the letter briefly. We are conducting a study as part of a statewide needs assessment for Nevada’s Supplemental Nutrition Assistance Education Program (SNAP-Ed). In the event that you are not familiar with SNAP-Ed, the goal of this effort is to “to improve the likelihood that persons eligible for SNAP will make healthy food choices within a limited budget and choose physically active lifestyles consistent with the current 2015-2020 Dietary Guidelines for Americans and the USDA food guidance.” The findings of the assessment will be used to strengthen Nevada’s SNAP-Ed Plan by modifying programs and approaches, or developing new programs as/if indicated. You are among a group of forty professionals that have been identified as having knowledge about households and communities that may be served by SNAP-Ed efforts. To benefit from your expertise, we would like to ask you to participate in a telephone interview. The purpose of the interview is to obtain your opinions about the nutrition education needs of the SNAP-Ed audience and opportunities to positively impact the nutritional health of residents in low-income communities.

The telephone interview will be scheduled at your convenience and will last no longer than 30 minutes.”

“Would you like to participate in this study?”

“Yes” Response: Wonderful! Is there a specific day or time that would be best for you for me to call you to conduct the interview?

(Schedule appointment day and time) “Thank you for agreeing to participate in the study. I will send you a follow-up email confirming the date and time of our interview. The email will also include two attachments. The first attachment will be an Information Sheet which describes our research study. Please review the information sheet sometime before the interview. The second attachment is our “Interview Definitions Sheet,” which will be needed during the
interview. Please print out the “Interview Definition Sheet” prior to our interview. Can you please give me your email address?” What is the best phone number to reach you? Thank you for your time. I am looking forward to the interview.
“No” Response: Okay, is there a better day or time for you?
“Yes” Response: We can work around that. (Schedule appointment day and time)
“No” Response: Thank you for your time. If you happen to change your mind and would like to participate, please do not hesitate to contact me. My contact information is located in the letter sent to you.
Appendix C
Follow-up Email

Dear ______,
Thank you for agreeing to participate in our research study. I am writing to confirm the date and time of your telephone interview. Below is your scheduled interview information:
Date, Time
If this time no longer works for you, please reply to this email so that we can reschedule.
Attached to this email is an information sheet describing our research study. Please take a few minutes to review this information sheet prior to the interview.
In addition, attached to this email is a “Definitions Sheet” that will be helpful you to have in front of you during our interview. Please print this document and have it with you at the time of the interview.
I am looking forward to speaking with you.
Sincerely,
Megan Schwartz
Nutrition Graduate Student
Appendix D
Information Sheet

Nevada Supplemental Nutrition Assistance Program Education (SNAP-Ed)
Statewide Needs Assessment
Information Sheet

We are conducting a research study to obtain the opinions of professionals throughout Nevada regarding the nutrition and physical activity needs of the SNAP-Ed audiences. The findings of the assessment will be used to strengthen Nevada’s SNAP-Ed Plan by modifying programs and approaches, or developing new programs as/if indicated by key findings.

If you volunteer for this research study you will be asked to participate in a telephone interview. During the interview, you will first be asked your opinions about the nutrition education needs of SNAP-Ed audiences and opportunities to positively impact the nutritional health of residents in low-income communities. You will also be asked about the needs of several special populations.

The interview will take no longer than 30 minutes.

This study is considered to be minimal risk of harm. This means that the risk level is typical of those encountered during daily activities. While we do not anticipate it, some questions may cause you to feel uncomfortable. If this occurs, please inform us and we can skip the question or you can withdraw from the study entirely.

Benefits of doing research are not definite; however, in this study, we hope to learn how SNAP-Ed efforts can be more efficiently and effectively focused, to yield the greatest benefit among the SNAP-Ed target audience. There are no direct benefits to you.

The researchers; the University of Nevada, Reno; U.S. Department of Agriculture’s Supplemental Nutrition Assistance Program and the Nevada Division of Welfare and Supportive Services will treat the information we collect about you with professional standards of confidentiality and protect it to the extent allowed by law. We will ask you during the interview for your permission to use your name in our report, without your name being connected to your data. The researchers; the University of Nevada, Reno; U.S. Department of Agriculture’s Supplemental Nutrition Assistance Program and the Nevada Division of Welfare and Supportive Services may look at your study records.

You may ask questions of researchers at any time using the contact information below:
Jamie Benedict, PhD, RD, LD: email jamieb@cabnr.unr.edu, phone 775-784-6445
Megan Schwartz: email meganschwartz@nevada.unr.edu, phone 775-784-6496

Your participation in this study is completely voluntary. You may stop at any time. Declining to participate or not answering specific interview questions will not have any negative effects on you.

You may ask about your rights as a research participant. If you have questions, concerns, or complaints about this research, you may report them (anonymously if you choose) by calling the University of Nevada, Reno Research Integrity Office at 775.327.2368.

Thank you for your participation in this study.
Appendix E
Definitions Sheet

SNAP-Ed Target Audience: SNAP participants and low-income individuals who qualify to receive SNAP benefits (i.e. gross income <130% of the poverty line) or other means-tested Federal assistance programs, such as Medicaid or Temporary Assistance for Needy Families. It also includes individuals residing in communities with a significant low income population.¹

Goal of SNAP-Ed: To improve the likelihood that persons eligible for SNAP will make healthy food choices within a limited budget and choose physically active lifestyles consistent with the current 2015-2020 Dietary Guidelines for Americans and the USDA food guidance.¹

Healthy Eating: “Consuming each of the five food groups in proportion to MyPlate recommendations and other behaviors consistent with the Dietary Guidelines.”²

Examples: Making half of your plate fruits and vegetables, varying your veggies, choosing whole fruits- fresh, frozen, or canned in 100 percent fruit juice, making half of your grains whole grains, moving to low-fat or fat-free milk or yogurt, varying your protein routine, reducing sodium consumption, cutting back on foods high in solid fats, cutting back on foods high in added sugars, choosing vegetable oils instead of butter, and oil based sauces and dips instead of ones with butter, cream, or cheese.

Healthful Shopping: “Selecting and purchasing foods and beverages that correspond to MyPlate and the Dietary Guidelines.”²

Examples: Choosing healthy foods on a budget, reading nutrition facts labels or nutrition ingredient lists, buying 100 percent whole grain products, buying low-fat milk or dairy products, buying foods with lower added solid fats, sugar, and salt/sodium.

Food Resource Management: “The handling of all foods, and resources that may be used to acquire foods, by and individual or family”²

Examples: Not running out of food before month’s end, strategic utilization of food assistance resources (ex. SNAP, WIC, food pantry), comparing prices before buying foods, identifying foods on sale or use coupons to save money, shopping with a list, batch cooking (cook once; eat many times), using unit pricing to find the best values, cooking healthy foods on a budget.

Food Safety: “Food handling and preparation practices that reduce risk of foodborne illnesses.”

Examples: Washing their hands, cutting boards, and knives after using them to prepare raw chicken, meat, or fish, preparing raw foods separately from other foods, cooking ground beef or meat loaf until it is no longer pink, using a food thermometer to check if meat and chicken is completely cooked, refrigerating meat and dairy within 2 hours of shopping.
Physical Activity: “Any body movement that works muscles and requires more energy than resting, including cardiovascular fitness, flexibility, and muscle strength.”

Examples: Achieving or maintaining cardiovascular fitness, achieving or maintaining flexibility, achieving or maintaining muscle strength.

Sedentary Behavior: “Too much sitting or lying down at work, at home, in social settings, and during leisure time.”

Examples: Reducing television viewing, reducing computer and video games, reducing sitting on weekdays while at work, at home, while doing course work, and during leisure time.

Scale for Questions on Need


Appendix F
Semi-Structured Interview Guide

Introduction:
Thank you again for taking the time to speak with me today. As noted in the Information Sheet, today I want to ask you some questions about the needs of Nevada’s SNAP-Ed audience and opportunities to positively impact the nutritional health of residents in low-income communities. Do you have any questions about anything you have read before we get started?

The interview should take about 30 minutes. During the interview I will have you on speakerphone in a secure university office and will be using an audio-recorder (have the recorder on the table at this time) and taking notes to help stay organized. Please do not take offense if I ask for more information about your answer. I just want to be sure I understand what you mean. There are no “right” or “wrong” answers to these questions – we are interested in your opinions and experiences.

When we start the interview, I am not going to use your name to make sure it is not on the recording. Do you have any questions about the study or anything you have read in the information sheet before we begin? (Answer any questions the participant has before proceeding.) I am turning on the recorder now.

Can you please give your verbal consent to participate in this interview and for it to be audio recorded?

Questions

Part 1: Introduction
I would like to begin by asking a few brief questions about you.

1. First, how long have you been at your current position?
2. How many total years have you lived in Nevada?
3. Which of the following best describes how often you have face-to-face interaction with persons residing in low-income communities in Nevada?
   a. Never
   b. Rarely
   c. Sometimes
   d. Regularly

Part 2: Needs
Thank you, now at this time, would you please take out the document that was emailed to you that is titled, “definitions sheet.” Do you have this document?
If answer is “yes”,
   If you haven’t done so, would you please take a minute or two to review it now?
   Do you have any questions about what you have read?
If answer is “no”:
   Is there a way I can send it to you now? Either by email or text? (Allow time for them to open and review definitions)
With these definitions in mind, I would like to ask you about 6 topics that relate to the goal of SNAP-Ed. These 6 topics are defined on your definitions sheet. For each, I’ll ask you to rate the need for education on a scale from 1-5 with 1 equal to a “low level” and 5 equal to a “high level” need among Nevada’s SNAP-Ed audience based on your knowledge of and experience. If it would be helpful to you, there is a visual representation of the scale on the last page of your definitions sheet.

4. I am going to start with the topic of healthy eating. As noted on your definitions sheet, “healthy eating” is: “consuming each of the five food groups in proportion to MyPlate recommendations and other behaviors consistent with the Dietary Guidelines.”

4a. On a scale from 1-5 with 1 equal to a “low level” and 5 equal to a “high level,” how would you rate the need for education on healthy eating among Nevada’s SNAP-Ed audience? You may also answer with 0 if you don’t know or have no opinion.

4b. In your opinion, is there a particular healthy eating topic that is more important than others? If yes, explain.

5. Now I am going ask you about healthful shopping. As noted on your definitions sheet, “healthful shopping” is: “Selecting and purchasing foods and beverages that correspond to MyPlate and the Dietary Guidelines.”

5a. On a scale from 1-5 with 1 equal to a “low level” and 5 equal to a “high level,” how would you rate the need for education on healthful shopping among Nevada’s SNAP-Ed audience? You may also answer with 0 if you don’t know or have no opinion.

5b. In your opinion, is there a particular healthful shopping topic that is more important than others? If yes, explain.

6. Next, I am going to ask you about food resource management. As noted on your definitions sheet, “food resource management” is: “the handling of all foods, and resources that may be used to acquire foods, by an individual or family.”

6a. On a scale from 1-5 with 1 equal to a “low level” and 5 equal to a “high level,” how would you rate the need for education on food resource management among Nevada’s SNAP-Ed audience? You may also answer with 0 if you don’t know or have no opinion.

6b. In your opinion, is there a particular food resource management topic that is more important than others? If yes, explain.

7. Now I am going ask you questions about food safety. As noted on your definitions sheet, “food safety” is: “Food handling and preparation practices that reduce risk of foodborne illnesses.”

7a. On a scale from 1-5 with 1 equal to a “low level” and 5 equal to a “high level,” how would you rate the need for education on food safety among Nevada’s SNAP-Ed audience? You may also answer with 0 if you don’t know or have no opinion.

7b. In your opinion, is there a particular food safety topic that is more important than others? If yes, explain.
8. Next, I am going to ask you about physical activity. As noted on your definitions sheet, “physical activity” is: “any body movement that works muscles and requires more energy than resting, including cardiovascular fitness, flexibility, and muscle strength.”

8a. On a scale from 1-5 with 1 equal to a “low level” and 5 equal to a “high level,” how would you rate the need for education on physical activity among Nevada’s SNAP-Ed audience? You may also answer with 0 if you don’t know or have no opinion.

8b. In your opinion, is there a particular physical activity topic that is more important than others? If yes, explain.

9. Now I am going to ask you about sedentary behavior. As noted on your definitions sheet, “sedentary behavior” is: “too much sitting or lying down at work, at home, in social settings, and during leisure time.”

9a. On a scale from 1-5 with 1 equal to a “low level” and 5 equal to a “high level,” how would you rate the need for education on sedentary behavior among Nevada’s SNAP-Ed audience? You may also answer with 0 if you don’t know or have no opinion.

9b. In your opinion, is there a particular sedentary behavior topic that is more important than others? If yes, explain.

Part 3: Special Populations
Thank you for answering those questions. Now, I would like to ask you about the needs of several specific populations in Nevada, since some may be at higher risk for poor nutritional health compared to others. As you answer these questions, please keep the goal of SNAP-Ed in mind (as noted on the definitions sheet). If you have no opinion or knowledge of any specific group of residents, please just let me know and we can skip to the next question.

10. In your opinion, how are the needs for education on nutrition and physical activity different among urban, rural and frontier communities? Can you tell me more about that? (Use probes as needed to differentiate among the urban rural and frontier communities. In the event that needs on both nutrition and physical activity are not mentioned, probe as needed.)

11. In your opinion, how are the needs for education on nutrition and physical activity different among specific racial/ethnic groups? Can you tell me more about that? (Use probes as needed to differentiate among specific racial/ethnic groups. In the event that needs on both nutrition and physical activity are not mentioned, probe as needed.)

12. In your opinion, how are the needs for education on nutrition and physical activity different among older adults? Can you tell me more about that? (In the event that needs on both nutrition and physical activity are not mentioned, probe as needed.)

13. In your opinion, how are the needs for education on nutrition and physical activity different among those who are disabled? For example, hearing or visually impaired, having restricted movement, or having an impaired cognitive capacity. Can you tell me more about that? (Use probes as needed to differentiate among specific disabled groups. In the event that needs on both nutrition and physical activity are not mentioned, probe as needed.)
14. In your opinion, how are the needs for education on nutrition and physical activity different among veterans? Can you tell me more about that? (In the event that needs on both nutrition and physical activity are not mentioned, probe as needed.)

Thank you. Your insights on these specific populations will be very helpful. In preparation for the next set of questions, I would like you to consider for a moment the population or group in Nevada that has the highest level of need for education on nutrition and physical activity.

15. Including but not limited to the groups we just discussed, what Nevada population or group, in your opinion, has the highest level of need for education on nutrition and physical activity? Feel free to take a moment to think about this.
   15a. In your opinion, what puts them at a higher risk?
   15b. Can you tell me more about that?

**Part 4: Policy, Systems, and Environmental Interventions**

Thank you again. I appreciate your full schedule and won’t keep you on the phone much longer.

As a means of introducing the last set of questions, I want to take a few moments to tell you more about SNAP-Ed in the event that you are not familiar with this effort. For many years, SNAP-Ed programs provided education directly to SNAP-Ed audiences. This was largely accomplished with classes offered through schools and other community organizations. Direct education continues to be a key characteristic of SNAP-Ed. More recently, SNAP-Ed programs have been required to also use public health approaches in combination with education to maximize impact. This new requirement recognizes the potential impact of policies, organizational practices and environmental characteristics on nutrition and physical activity behaviors. Ideally, SNAP-Ed programs improve knowledge through direct education as well as facilitate change in the community that makes it easier for the SNAP-Ed audience to make healthful choices.

With that in mind, I have two questions I would like to ask you about this recent change. A few minutes ago, you stated that ________________ (Insert response to Question 15) have the highest need for education on nutrition and physical activity.

16. In your opinion, how could Nevada’s SNAP-Ed program make it easier for ________________ (Insert response to Question 15) to choose healthful foods more often?

17. In your opinion, how could Nevada’s SNAP-Ed program make it easier for ________________ (Insert response to Question 15) to be physically active more often?

**Closing**

Thank you for taking the time to answer my questions. Is there anything that you would like to add? Before I say goodbye, I have one more question. The findings of these interviews will be incorporated into a report for the Nevada Division of Welfare and Supportive Services.

18. Do we have permission to include your name in our report if it is not associated with your responses to questions?
Okay, I am going to turn off the recording device now. Can you please spell your first and last name for me and tell me your job title and affiliation? Thank you again for sharing your opinions with me.
Appendix G
Institutional Review Board Approval

DATE: February 3, 2017
TO: Jamie Benedict, PhD
FROM: University of Nevada, Reno Institutional Review Board (IRB)

PROJECT TITLE: [1008175-1] Nevada’s SNAP-Ed Statewide Needs Assessment
REFERENCE #: Social Behavioral
SUBMISSION TYPE: New Project

ACTION: APPROVED
APPROVAL DATE: February 3, 2017
EXPIRATION DATE: February 3, 2018
REVIEW TYPE: Expedited Review
REVIEW CATEGORY: Expedited review # 7

The above-referenced protocol was reviewed and approved by the UNR IRB in accordance with the requirements of the Code of Federal Regulations on the Protection of Human Subjects (45 CFR 46 and 21 CFR 50 and 56). This approval is based on assessment that the research met all applicable regulatory criteria. The research must be conducted in accordance with this approved submission. This submission has received Expedited Review based on applicable federal regulations.

Please prepare your continuing review form at least 4 weeks prior to your expiration date using IRBNet. https://www.irbnet.org. Our office will send you a courtesy reminder to that effect. Unless renewed, the IRB only has authority under the federal regulations to allow a study to be open 12 months or less. There is no grace period. The study will be closed on the above stated expiration date unless the IRB receives and approves a continuing review report.

Instructions on preparing a modification or submitting your renewal is located on our web site at http://www.unr.edu/research-integrity/human-research/irbnet. Call our office if you have any questions or problems with use of IRBNet software.

Approved Documents
If you have any questions, please contact Nancy Moody at 775.327.2367 or at nmoody@unr.edu.

NOTE for VA Researchers: You are not approved to begin this research until you receive an approval letter from the VASNHCS Associate Chief of Staff for Research stating that your research has been approved by the Research and Development Committee.

Sincerely,

Richard Bjur, PhD
Co-Chair, UNR IRB
University of Nevada Reno

Janet Usinger, PhD
Co-Chair, UNR IRB
University of Nevada Reno

This letter has been electronically signed in accordance with all applicable regulations, and a copy is retained within University of Nevada, Reno IRB’s record.