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EVALUATING THE EXPERIENCES OF FCS COOPERATIVE EXTENSION AGENTS USE OF POLICY, SYSTEMS AND ENVIRONMENTAL STRATEGIES TO REDUCE OBESITY IN RURAL COUNTIES

Jordan Lynn Bressler

University of Kentucky, jordanlynn.bressler@gmail.com

Author ORCID Identifier:

 <https://orcid.org/0000-0002-7958-2116>

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Jordan Lynn Bressler, Student

Dr. Heather Norman-Burgdolf, Major Professor

Dr. Alison Gustafson, Director of Graduate Studies

EVALUATING THE EXPERIENCES OF FCS COOPERATIVE EXTENSION
AGENTS USE OF POLICY, SYSTEMS AND ENVIRONMENTAL STRATEGIES TO
REDUCE OBESITY IN RURAL COUNTIES

THESIS

A thesis submitted in partial fulfillment
of the requirements for the degree of
Master of Science in Nutrition and Food Systems in
the College of Agriculture, Food and Environment
at the University of Kentucky

By

Jordan Lynn Bressler, RD, LD

Lexington, Kentucky

Director: Dr. Heather Norman-Burgdolf, PhD

Lexington, Kentucky

2019

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<https://orcid.org/0000-0002-7958-2116>

ABSTRACT OF THESIS

EVALUATING THE EXPERIENCES OF FCS COOPERATIVE EXTENSION AGENTS USE OF POLICY, SYSTEMS AND ENVIRONMENTAL STRATEGIES TO REDUCE OBESITY IN RURAL COUNTIES

High rates of obesity are seen across the country with rural areas disproportionately affected. Based on the socio-ecological model, policy, system, and environmental approaches targeted at the population level have the potential to create more sustainable health behavior change than individual level approaches. Historically, the Cooperative Extension Service (CES) has provided direct education related to healthy eating and active living in response to high obesity rates. Utilizing the resources and infrastructure of the CES, the Centers for Disease Control challenged CESs across the country to implement PSE strategies in counties with obesity rates greater than 40% through the CDC 1416 High Obesity Project. This qualitative study examined the experiences of Family and Consumer Science (FCS) Cooperative Extension Agents in conducting PSE strategies in addition to their direct education roles within their rural counties in an effort to reduce the high prevalence of obesity. Semi-structured, in-depth interviews with ten FCS Extension agents from Kentucky and Tennessee were conducted upon completion of the project and were analyzed thematically. These FCS agents encountered several barriers while implementing PSE strategies including inadequate training and poor communication regarding responsibilities and available resources. In addition, FCS agents found PSE work to be overwhelming and time consuming. Agents felt that support from project staff and their community partners allowed them to be successful. Findings from this study will be used to better prepare FCS agents in other rural counties across the country to conduct PSE work in an effort to reduce obesity prevalence in their communities.

KEYWORDS: PSE, obesity, rural health, physical activity, dietary behaviors,
Cooperative Extension

Jordan Lynn Bressler, RD, LD

05/01/2019

Date

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By

Jordan Lynn Bressler, RD, LD

Heather Norman-Burgdolf, PhD
Director of Thesis

Alison Gustafson, PhD, RD, LD
Director of Graduate Studies

05/01/2019

Date

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CHAPTER 1. INTRODUCTION

1.1 Background

Rural areas throughout the United States, and across the globe, are seeing increased rates of obesity in their communities. Although urban areas are also experiencing higher rates of obesity than they have in the past, rural communities seem to be disproportionately affected (Johnson & Johnson, 2015). Kentucky and Tennessee are two states that have a large percentage of their population living in rural areas and have been unable to escape the reality of the obesity epidemic. According to the Centers for Disease Control and Prevention (2012), six counties in Kentucky and four counties in Tennessee were identified as having an adult obesity prevalence greater than 40%. This undesirable trend in rural areas is related to rural residents partaking in less physical activity during leisure time and inadequate dietary behaviors (Patterson et al., 2017; Gustafson et al., 2018). Poor physical activity infrastructure and the inability to access fruits and vegetables within communities were identified as contributing to these unhealthy behaviors (Gustafson, 2018).

Cooperative Extension Service Family and Consumer Science (FCS) Agents are leaders within the community who can assist in facilitating efforts to decrease the prevalence of obesity especially in these rural areas. Among many other duties, FCS Extension Agents conduct nutrition education programs that are generally targeted towards altering the behaviors of individuals, families, and small groups (Majee, Maltsberger, Johnson, & Adams, 2014). However, direct education at the individual, family, or small group level does not always create sustainable behavior change. In addition, the contributors to obesity in rural areas that have been identified are not at the individual level

but instead the population level (Gustafson, 2018). Policy, system, and environmental (PSE) changes are an approach that community health professionals are beginning to adopt to target these population level contributors of obesity as well as create sustainable change in the health and well-being of their communities.

PSE strategies are designed to impact entire communities and can involve both the encouragement and discouragement of specific activities. PSE changes in this specific case are related to increasing physical activity and improving dietary patterns as an obesity preventative approach (Comprehensive, 2015). These strategies are often considered to be place-based, or individualized for the specific community of implementation. As with any approach used to improve health behaviors, there are barriers for those developing and implementing PSE strategies and resources that are necessary for success. With FCS Extension Agents implementing PSE strategies, the assessment of their experiences is especially important as this work is much different than the direct education commonly conducted in Extension.

1.2 Statement of the Problem

Historically, FCS Cooperative Extension Agents have utilized direct education methods to alter the dietary and physical activity behaviors of individuals in their communities to reduce obesity. Evidence from other fields suggests that there are benefits to utilizing PSE strategies because these methods create a more sustainable alteration of behaviors at the population level. However, there has been limited assessment of barriers of implementation and resources that aid in success of PSE strategies within FCS Cooperative Extension. The purpose of this study is to determine the best strategies to

prepare FCS Extension Agents to conduct PSE work to reduce the prevalence of obesity in other rural communities.

1.3 Research Questions

1. What resources are necessary for Family and Consumer Science Cooperative Extension Agents to conduct PSE work in rural Kentucky and Tennessee counties to reduce the prevalence of obesity?
2. What barriers do Family and Consumer Science Cooperative Extension Agents in rural Kentucky and Tennessee counties encounter when implementing PSE strategies to reduce the prevalence of obesity?

1.4 Hypotheses

1. Increased implementation of PSE strategies by FCS Cooperative Extension Agents in the ten rural Kentucky and Tennessee counties will be dependent upon program funding opportunities and technical support from the their respective land-grant institution.
2. Lack of community engagement within the ten rural Kentucky and Tennessee counties will be the largest barrier experienced by FCS Cooperative Extension agents to implement PSE strategies to reduce the their respective land-grant institution.

CHAPTER 2. REVIEW OF LITERATURE

2.1 Introduction

Obesity is running rampant throughout the United States and is not leaving any state behind, especially the southeastern region. In both Kentucky and Tennessee, about one in every three adults are obese (CDC, 2016). As the prevalence of obesity rises, the United States has seen, and will continue to see, a rise in the prevalence of diabetes, cardiovascular disease, osteoarthritis and other musculoskeletal disorders, and certain cancers that are direct consequences of obesity (WHO, 2018). Data has shown that individuals in rural areas are disproportionately affected by obesity compared to those living in urban areas (Patterson et al., 2017). Kentucky and Tennessee are both important states to consider in this phenomenon as the majority of the counties in each of these states are considered to be rural (TN Department of Health, n.d.; Davis, 2019).

Family and Consumer Science (FCS) Cooperative Extension Service Agents are trusted and valued as public health professionals, providing evidence-based information, within counties (Majee, Maltsberger, Johnson, & Adams, 2014). FCS Extension Agents are working to combat obesity through traditional programming events such as nutrition education and cooking classes, annual exercise events, and community health events such as health fairs. To create sustainable change within communities related to obesity, FCS Extension Agents are being encouraged to conduct policy, system, and environmental (PSE) changes. As with any adoption of new strategies, the level of engagement in these practices, as well as barriers, is always a concern. The purpose of this study is to describe the experiences of FCS Extension Agents in implementing PSE strategies in high-obesity

rural Kentucky and Tennessee communities in an effort to create long-lasting health changes related to obesity prevention.

2.2 Obesity in Rural Areas

The national adult obesity rate for the United States is reported as 39.6% which is a 9% increase over the last 16 years (Trust for America's, 2018). Although obesity is on the rise across the entire country, evidence suggests that there is a disparity between rural and urban areas. A relationship between greater obesity prevalence in rural areas has been found even after controlling for socioeconomic factors (Befort, Nazir & Perri, 2012). The cross-sectional study "Prevalence of Obesity Among Adults from Rural and Urban Areas of the United States" found a 6% difference in the prevalence of obesity in rural areas compared to urban areas (Befort, Nazir, & Perri, 2012). Rural obesity prevalence was 39.5% while urban obesity prevalence was 33.4%. A meta-analysis of ten studies specifically looking at childhood obesity in rural versus urban areas determined that children, ages two to nineteen, living in rural areas have a 26% increased odds of being obese compared to urban children (Johnson & Johnson, 2015). This phenomenon is not isolated to the United States. A prospective cohort study conducted in Australia, by Patterson et al, followed 2049 school children until they were between 31 to 41 years old (2017). They found that those who spent the most amount of their years living in rural areas compared to urban areas had greater BMIs and a likelihood of being obese. Those who reported living in a rural area during mid-adulthood, or ages 26-30, were found to have the highest BMI and likelihood of being obese. Because this relationship between obesity and rural areas has been shown despite accounting for socioeconomic factors, it is

suggested that the actual rural environment, or population-wide systemic issues unique to rural populations, may be the primary risk factor for obesity (Liu et al., 2012).

The researchers suggested these findings may be related to less physical activity during leisure time, greater consumption of alcohol, and inadequate dietary behaviors of those living in rural areas (Patterson et al., 2017). An important result to note is that rural residents reported consuming a higher proportion of kilocalories from fat. This disparity in obesity is effecting all ages, not just adults. Stakeholders from the six the rural counties with greater than 40% obesity prevalence identified several contributors to obesity in their counties (Gustafson et al, 2018). These included inadequate physical activity infrastructure and access to fruits and vegetables. These studies suggest that individual factors may not be the primary cause of obesity in these areas and community stakeholders in rural community may need to target their efforts to change dietary and physical activity behaviors at the community level.

2.3 Obesity in Kentucky and Tennessee

Kentucky and Tennessee are two largely rural states that are also seeing much of its population affected by obesity. 70 of the 95 counties in Tennessee and 80 of the 120 in Kentucky have been identified as rural (UTIA, n.d.; Davis, 2009). These two states have seen between a 5% and 10% increase in adult obesity rates since 2012 (Trust for America's, 2018). The overall state adult obesity rate for Kentucky is 34.3% and Tennessee is 32.8%. Out of the 51 states, Kentucky currently ranks eighth while Tennessee is ranked fifteenth for the highest adult obesity rates in the United States. Several counties in these two states have obesity rates greater than the national average. Six Kentucky counties and four Tennessee counties were found to have a prevalence of adult obesity

greater than 40% (CDC, 2012). In addition, between 47% and 100% of the population in these ten counties live in rural areas (National Center “Kentucky,” 2016; National Center “Tennessee,” 2016).

The root cause of obesity is energy consumption-expenditure imbalance as a result of poor dietary and physical activity behaviors which are significant issues in many states including Kentucky and Tennessee. Centers for Disease Control and Prevention data (2016) shows that in both Kentucky and Tennessee only approximately 45% of adults are exercising the recommended amount of 150 minutes of moderately intense activity per week. This data also indicates that 46.9% of Kentucky adults are consuming fruit less than once per day and about 24.6% are consuming vegetables less than once per day. Similarly, 45.2% of Tennessee adults report consuming fruits less than one time per day and 22.6% report consuming vegetables less than one time per day. In addition, 28.4% of adults in Tennessee reported not engaging in any leisure-time physical activity. Kentuckians report slightly less leisure-time physical activity with 29.8% engaging in no leisure-time physical activity.

Implications of obesity include a higher risk of developing diabetes, cardiovascular disease, osteoarthritis and other musculoskeletal disorders, and certain cancers (WHO, 2018). Kentucky and Tennessee have both been unable to avoid this reality, facing significant rates of these obesity-related health concerns. Among the adult population in Kentucky, 12.9% have been diagnosed with diabetes mellitus and 39.4% of adults are living with hypertension. In addition, there were 68,075 cases of obesity-related cancer, 876,143 cases of arthritis, and 264,958 cases of cardiovascular disease reported in 2010 (Trust for America’s, 2018). The rates of diabetes and hypertension in Tennessee are

comparable to those of Kentucky, 13.1% and 38.7% respectively. However, the number of other obesity-related health issues in Tennessee are greater than those of Kentucky. In 2010, 101,201 cases of obesity-related cancer, 1,289,571 cases of arthritis, and 396,752 case of cardiovascular disease were reported in Tennessee (Trust for America's, 2018). Until rates of obesity begin to drop, these two states in addition to many others will continue to see a decline in the health and quality of life of its population as a result of these obesity-related consequences.

2.4 The Cooperative Extension Service

In 1862, the Morrill Act was signed into law to provide states with public lands for the creation of land-grant universities to focus on agriculture and mechanical arts research (Library, 2017). Fifty years later, the Cooperative Extension Service began in 1914 with the implementation of the Smith Lever Act. This act created a partnership between the United States Department of Agriculture and land-grant universities across the country (Cooperative Extension, n.d.). The goal of this partnership was to conduct research and apply the findings to provide education to the general public related to agriculture, specifically in regards to rural concerns.

The work of the Cooperative Extension Service was initially driven by the need to increase yields, decrease field labor shortages, and preserve perishable food during World War I to ensure the United States was adequately able to feed its citizens. During the course of the Great Depression, Extension home economists focused on teaching the women of rural areas nutrition, canning, gardening and poultry production, and sewing skills to help survive the times of low yields and financial struggles (Cooperative Extension, n.d.). The Extension home economists of the Great Depression still exist today in the form of Family

and Consumer Science (FCS) Agents. Additional areas of Extension programming include 4-H and Youth Development, Community and Economic Development, and Agriculture and Natural Resources (University, 2014).

At the time that the Cooperative Extension Service began, over half of the United States population lived in rural parts of the country. Because of this, the United States government passed the Smith Lever Act with the primary intent of keeping the focus of Extension on rural, agricultural research. As the number of people living in rural areas in the United States has decreased to about 17%, Extension has adapted its role to assist rural, urban, and suburban farmers, communities, families, and children (University of Kentucky, n.d.). There are currently about 16,000 Extension Agents disseminating research and teaching communities to improve counties across the country (UTIA, n.d). This number includes the Extension Agents working in every county in Kentucky and Tennessee, including the 80 rural counties in Kentucky and 70 rural counties in Tennessee (University, n.d.; UTIA, n.d.; Davis, 2009). Despite the Cooperative Extension Service's adaptation to a decreasing rural population, Extension Agents are still working with a significant number of rural communities.

The role of FCS Extension Agents today is to promote healthy living throughout their counties, both rural and non-rural. FCS Extension programs provide education on food preparation, food safety, nutrition, financial management, healthy lifestyles, parenting and relationship skills and other topics to better the lives of individuals, families and communities (NEAFCS, 2018). Traditionally, the health education programs of FCS Extension Agents have had an individual and family focus at the local level related to behavior change (Majee, Maltsberger, Johnson, & Adams, 2014). This instruction by FCS

Extension Agents generally takes place as a program whether a meeting, a stand-alone event, or a succession of educational sessions. Agents are intentional in the development and implementation of these programs. They conduct needs assessments, plan, evaluate report, and involve stakeholders when preparing and conducting programs. Through the use of this process of program development, Agents are choosing programs and topics specific to the issues their the individuals in their communities are facing. Although many challenges of the Great Depression have passed, many rural communities are facing a new crisis- the epidemic of obesity. In addition to utilizing their traditional individual approach to health education programming, FCS Extension is beginning to incorporate new approaches that align with their larger initiatives to counter this epidemic including the use of policy, system, and environmental strategies.

2.5 Policy, System, and Environmental Change

The World Health Organization states that alterations in dietary and physical activity behavior patterns “are often the result of environmental and societal changes associated with development and lack of supportive policies in sectors such as health, agriculture, transport, urban planning, environment, food processing, distribution, marketing, and education (2018).” One approach to sustainability in the improvement of the health and well-being of a community is policy, system, and environmental (PSE) change (Comprehensive, 2015). PSE changes seek to go further than individual-level programs to create or enhance the structures of a community or region. The PSE changes may be integrated or be causal of each other. These changes result in the production of long term behavior changes at the population level. Policy changes are enacted at the legislative or organizational level within federal, state, or local governments, schools,

parks, healthcare systems, and other community or worksite institutions. Policy and system changes are often intertwined. System changes are related to the alteration of the culture or expectations of an organization. This is due to the modification of processes and/or procedures from the normal operations of the organization. Changes to the physical environment -physical, social, or economic- that impact the greater population are considered environmental changes (Food, 2012).

Although PSE change does focus on the community or population level, its success does largely depend on the change of individual behavior. The discouragement of unhealthy decisions and the encouragement of healthy decisions are both characteristics of PSE change. Examples include the addition of sidewalks and pedestrian-friendly intersections to neighborhoods, school policies that do not allow the sale of unhealthy foods for fundraisers, and implementing a voucher system to provide additional money for low-income families to purchase fruits and vegetables (Comprehensive, 2015). These strategies involved with PSE change create repetitive or constant modifications to a community. This is different from the traditional individual-level programming of FCS Extension Agents and other public health professionals which often include a single nutrition education unit or involve a health screening one time per year (Food, 2012).

Collaboration within the community is critical for PSE change to be successful. This collaboration can include program and intervention evaluation, data collection and sharing, identification of leaders within the community and strengths of the culture, and the development of strategic partnerships. Community groups and members are assets because of their diverse experiences, skills, and knowledge. PSE change would not be successful or lead to permanent behavior modifications related to the health and well-being

of populations without the empowerment of the community and its members, actual change to the environment, and the transferability of proven interventions (Comprehensive, 2015).

2.6 Socio-Ecological Model

The socio-ecological model (SEM) is a framework that health professionals often use when addressing the dietary and physical activity behaviors of a population, which is the primary focus of PSE change. This model takes into account the different levels of influence on an individual's behavior related to health and well-being. The levels include individual, interpersonal, organizational, community, and public policy. Factors within the individual level are knowledge, attitudes, beliefs, and personality traits. Friends, family, and peers are encompassed by the interpersonal level. The community level includes social networks, norms, and standards while public policy refers to the policies and laws at the local, state, and federal levels (Smathers & Lobb, 2014). The common use of the SEM for obesity intervention did not begin until the 2000s, therefore, this idea is still fairly novel for many individuals working in community and public health (Li, Dickin, & Dollahite, 2014).

Examination of what behaviors are associated with different levels of the SEM is critical for implementing PSE strategies that will have the most success. A cross-sectional study of 6693 school children and 289 teachers from sixty-four schools used anonymized questionnaires and a survey to increase understanding of factors of various SEM levels and their relationship with the dietary choices of children. The researchers found that interpersonal factors play a larger role on the at-school lunch choices of students compared to individual factors. Individual factors were determined to have a greater association with

the choices of children make outside of the school. Additionally, organizational factors of the school were associated with the students' consumption of unhealthy foods. Overall, the consumption of healthy foods was most associated with the community level (Townsend & Foster, 2011).

2.7 Barriers for Healthy Behaviors

Specifically related to rural Kentucky counties, one study of six counties with greater than 40% obesity rates was conducted to determine barriers for healthy behaviors in order to assist in developing future place-based interventions to reduce obesity. A random-digit dial survey was administered to 756 adults and community stakeholders were brought together for discussions about the needs and strengths of each community. FCS Extension agents formed coalitions with the stakeholders to facilitate and lead these discussions. From coalition discussion, stakeholders identified poor access to fruits and vegetables and inadequate infrastructure for physical activity as primary contributors to obesity which is consistent with previous literature. An association between being moderately to seriously concerned about obesity and healthy eating behaviors and shopping at a supercenter were determined by this study. Safety and accessibility were two factors important in the concern of physical activity (Gustafson et al, 2017). To implement PSE strategies, factors effecting the choices of individuals within a community must be identified and taken into account. The SEM is an important framework to use when examining these interactions and designing interventions (Smathers & Lobb, 2014).

Currently, FCS Extension Agents across the country are engaged in PSE changes related to obesity prevention but to varying extents. A study from New York State Cooperative Extension Service found that most nutrition educators are involved in PSE

work at a very minimal level. This minimal level of engagement includes serving as a resource for healthy eating and physical activity information and recommendations. A very limited number of nutrition educators were found to be involved in environmental changes through development, implementation, and evaluation (Lu, Dickin, & Dollahite, 2014). Another cross-sectional study of New York Cooperative Extension Service identified several factors for the varying levels of engagement of nutrition educators in PSE strategies. Recognition of the readiness of the community, expectations of others to use the strategies, the number of employees managed, and extent of networking were all factors significantly related to the increased use of PSE strategies. Nutrition educators were less likely to utilize PSE strategies as their belief that obesity is most related to the individual level of the SEM increased. An important note from this study is that specific funding for PSE work was not significantly related to an increased utilization of the strategies (Lu, Dickin, Constan, & Dollahite, 2017).

2.8 Program Evaluation

The use of PSE strategies is a new approach being utilized by public health professionals. In order to build practice-based evidence for these health-promoting strategies, it is important to conduct evaluations of such programs and strategies. Carol Weiss (1998) defines evaluation as “the systematic assessment of the operation and/or the outcomes of a program or policy, compared to a set of explicit or implicit standards, as a means of contributing to the improvement of the program or policy (p. 4).” In addition to measuring the effect of a program and its components on health outcomes, a vital aspect of evaluation is studying the implementation of the program regardless of a positive, negative, or unknown effect which is considered a process evaluation (Leithwood &

Montgomery, 1980). Programs conducting PSE strategies are often complex, involving many stakeholders, many casual factors, and are implemented over an extended period of time (Honeycutt et al, 2015). Evaluating the process including how the stakeholders interacted and communicated, factors that led to success and failure, and the steps that were involved in intervention implementation provides valuable information for program improvement and replication (Leithwood & Montgomery, 1980). Utilizing qualitative methods, such as interviews with program leaders, has proved to be helpful in gathering this information as well as exploring other contextual factors impacting the effectiveness of the intervention (Rychetnik, Frommer, Hawe, & Shiell, 2002).

2.9 Conclusion

Family and Consumer Science Extension Agents are public health professionals that are in prime positions to make an impact on the foundational causes and risk factors that lead to chronic diseases such as obesity on a local level. This is important to recognize as the prevalence of obesity is increasing at staggering rates especially in rural areas of the United States. Because living in rural areas puts residents at a disproportionate risk for obesity, long-term, community-based, sustainable changes are necessary to begin reversing, or at least stunting, the growth of this rate. PSE strategies have proven effective in this type of change. This can be contributed to the use of the SEM in determining the most influential factors in each specific community related to obesity prevention. Despite the effectiveness of PSE change and the SEM, nutrition education professionals are not commonly utilizing these concepts. Few studies have been conducted to define barriers related to this alteration in the role and tasks of FCS Extension Agents. It is important to further determine how FCS Extension Agents and other nutrition educators and public

health professionals can be best equipped successfully implement PSE obesity interventions.

CHAPTER 3. METHODOLOGY

3.1 Research Design

This qualitative study consisted of the collection of data from six University of Kentucky and four University of Tennessee Family and Consumer Cooperative Extension Agents who were involved in the CDC 1416 High Obesity Project. These ten counties the Agents worked in qualified to participate in the CDC 1416 High Obesity Project because their county adult obesity prevalence was greater than 40%, based on Behavior Risk Factor Surveillance Survey (BRFSS) data from 2010. A semi-structured, in-depth interview was conducted individually with each FCS Extension Agent between August 2018 and October 2018 to address the research questions. This study was approved by the Institutional Review Board at the University of Kentucky.

3.2 Interviews

The individual, semi-structured, in-depth interviews were conducted at the Cooperative Extension Office in the respective county of each Agent when possible. When Agents were unavailable for an in-person interview or the county was over a three hour drive from the University of Kentucky, the interviews were conducted by phone. Each interview was recorded on two devices and were between 20 and 75 minutes in length. A script (Appendix 1) containing prepared questions was created to guide these interviews in order to learn about the experiences of these Agents with the CDC 1416 High Obesity Project and policy, systems, and environmental change strategies (Guion, Diehl, & McDonald, 2011).

3.3 Data Analysis

Verbatim transcripts were produced from the audio recordings of the ten semi-structured interviews. The primary qualitative analyst read through the transcripts several times and created the initial codebook with definitions. This qualitative analyst, who was heavily involved in both the collection and analysis of the data, then coded all ten interviews. Following the creation of the codebook, two additional qualitative analysts reviewed and coded the transcripts independently (MacQueen et al, 1998). The interviews were imported into a qualitative analysis software, QSR NVivo 11, and coded by the primary qualitative analyst. The inter-rater reliability of the three coders was 99% which signifies excellent agreement between the analysts. Themes were then identified and established from the generated codes. A thematic analysis approach was used to guide the analysis of these transcripts (Braun & Clarke, 2006; Vaismoradi, Turunen, & Bondas, 2013).

CHAPTER 4. RESULTS

4.1 Background Information from Interviews with FCS Extension Agents

Ten Kentucky and Tennessee FCS Extension Agents involved in the CDC 1416 High Obesity Project were interviewed at their county CES office or via phone. The final sample included 100% of the FCS Extension Agents involved in the CDC 1416 High Obesity Project for both states- four Tennessee Agents and six Kentucky Agents (Figure 1).

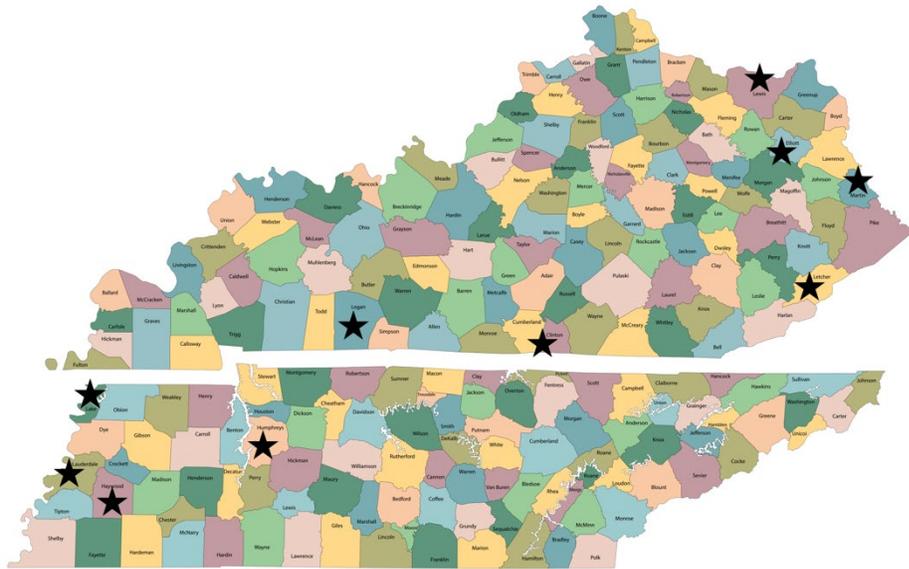


Figure 1. County locations of participants

These individual, semi-structured, in-depth interviews ranged from 20 to 75 minutes in length. Of the ten participants interviewed, several noted they had other CES responsibilities such as splitting their time as the county 4-H Agent. In addition, nine participants mentioned that other county CES Agents in their office were involved in the High Obesity Project in some capacity. The years of experience for each agent in total and for their respective county were collected at the beginning of each interview (Table 1).

Table 1. Agent experience in CES- total and in High Obesity Project county

	Total (years)	In High Obesity Project county (years)
County A	2	2
County B	2	2
County C	2.5	2.5
County D	11	11
County E	13	<1
County F	13	13
County G	13.5	13.5
County H	14	14
County I	>15	0.5
County J	17	14

The majority of participants (70%) have had a career in the Cooperative Extension Service greater than five years. Half of the participants were not in their respective county at the beginning of the CDC 1416 High Obesity Project. During the four year cycle of the project, 50% of the agents transferred into or began their CES career in their respective county. Only two participants noted that they had experience with the concept of PSE change and the strategies involved prior to the High Obesity Project, however, the majority had a basic understanding of the primary concepts of PSE such as population based change, obesity and long-term changes as gathered from the transcripts. Although 90% of the participants felt that PSE strategies were different compared to the direct education they generally conduct, 80% still felt that the work involved with PSE change aligned with the mission of the CES. Overall, all FCS Extension Agents interviewed felt that their community was improved as a result of the PSE strategies implemented as part of the CDC 1416 High Obesity Project.

4.2 Themes Identified from Interviews with FCS Extension Agents

Two main themes and seven subthemes were identified from the interviews with the ten FCS Extension Agents through the analysis of the interview transcripts. The main themes that emerged included barriers the Agents encountered when implementing these PSE strategies and necessities they felt contributed to success.

Theme 1: Barriers in conducting PSE strategies

Subtheme 1.1: PSE requires more planning and time

PSE strategies were recognized as requiring more effort to implement in comparison to their traditional direct education programming by the FCS Extension Agents. This included a significant amount of time spent researching supplies and equipment for ordering, conducting formal and informal community assessments, building partnerships, completing extra paperwork and reporting, and learning about policy, system and environmental changes. It was also mentioned that Agents had to think more creatively and keep in mind the bigger picture of the county and community when planning PSE related strategies and programming. Additionally, the Agents felt that it was easy to become caught up in the work and take on too many tasks themselves as result of the interconnected and large spanning nature of PSE strategies.

Subtheme 1.2: Agents lacked direction

FCS Extension Agents often mentioned a lack of direction in reference to both PSE strategies and the CDC 1416 High Obesity Project. The Agents were unsure what they were supposed to be doing as well as what was allowed at many points in the project. Those who transitioned into their respective county during the High Obesity Project cycle indicated that little to no formal training on PSE strategies and the High Obesity Project

was provided. As a result of the lack of clarity and formal training, Agents had difficulties conducting evaluations of implemented PSE strategies and creating a future plan for these strategies. Agents indicated they felt overwhelmed due to the lack of understanding of their specific responsibilities and the parameters of the project.

Subtheme 1.3: Community collaboration proved difficult at times

Planning for and implementing PSE strategies involves a high level of collaboration with the community in which they are taking place. Agents acknowledged that working with community groups and individuals was often a challenging task. Communication and pushback from partners were both seen as difficulties. Although many community members were enthusiastic about the PSE work being done, not all were receptive of the changes Agents were working towards and asking for collaboration. In addition, promises made by community members, especially in regards to the labor needed to install equipment, were not always completed in a timely manner. Several agents also brought up that it was sometimes difficult to allocate resources fairly among the communities within the county for reasons listed above and others.

Subtheme 1.4: Frustrations with the specific project

Related to the specific High Obesity Project, Agents had several frustrations. The project required a lot of extra administrative duties such as reporting and conference calls that took a significant amount of time from the Agents' other duties. The Agents also mentioned that this extra reporting was often redundant and they sometimes were unsure of how to complete what was being asked of them. When Agents talked about the redundancy of the paperwork, they discussed how many of the questions the project staff asked of them to report were the exact or very similar questions they were already

answering in other reports for the CES. Agents also shared that they felt this project caused them to feel more pressure than normal from many avenues including the state staff and their communities.

Another prominent topic mentioned when discussing frustrations was purchasing. Agents expressed frustration regarding the purchasing stipulations specific to the CDC Project such as the required approval process for every piece of equipment from each vendor and the inability to use project money to pay for equipment installation. Many Agents were also unaware of the budget for their county which added to frustration. They felt if they would have known the exact dollar amount of money they had to spend at the beginning of the project they would have been more thoughtful and strategic with their equipment purchasing. At the end of the project there was an amount of money leftover in the project budget and Agents were asked to quickly make purchases. Several Agents were frustrated by this and the concurrent requirement to drop the task or project they were currently working on to spend additional time on the High Obesity Project. They also felt they could have used this money earlier in the project cycle to make a larger impact in their communities compared to the end of the project cycle.

Theme 2: Necessities in conducting PSE strategies

Subtheme 2.1: Development of partnerships proved important for PSE changes

Agents worked with a large number of community partners and considered these groups and individuals to be key stakeholders in conducting PSE change in their communities. The five main categories of partnerships were county, social service organizations, local businesses, grocery stores and local government. Partnerships with schools and their Board of Education, YMCAs, hospitals, senior centers, Lions and

Kiwanis Clubs, 4-H clubs, libraries, churches, health departments and wellness centers were categorized as social service collaborations. Local business collaborations included partnerships with local hardware stores and television stations. Relationships with the Department of Transportation, state and local park directors and rangers, the Department of Commerce, tourism directors and jailers/prisons were considered county collaborations. Lastly, government collaborations included support from commissioners, mayors, magistrates and other elected officials. These partners often donated labor, equipment and supplies that the project could not pay for and/or were the receivers of the PSE changes. Agents acknowledged that these relationships with community partners and resources in their counties were a main aspect of working on PSE changes.

Subtheme 2.2: Community support attributed to success

In addition to collaborating with community partners, support from the community was considered necessary for agents to successfully implement PSE strategies. The open-mindedness and ability to be accepting of PSE strategies by the community as a whole was attributed to being helpful. Agents felt that most community members and partners enjoyed, supported and wanted to be involved in the High Obesity Project and PSE changes. These individuals and groups were thought to appreciate the efforts of the Agent. As a result, Agents were able to find community members, not necessarily a part of a community group collaborations, to assist in the installation of equipment which Agents would have otherwise been unable to do themselves. It was often expressed how important it was to find the “movers and shakers” within a community. These “movers and shakers” were considered to be those individuals who had the willpower and ability to take action

in their community and be a key player the development and implementation of PSE strategies.

Subtheme 2.3: Agent support from outside each community highly valued

Although the role of the county and its members were attributed to being particularly helpful in allowing Agents to be successful, support from outside these communities was also considered to be crucial. This type of support included technical assistance from the High Obesity Project national staff and CES state staff as well as having a network of other Agents involved in the project. Agents valued the guidance that the CES state staff and High Obesity Project staff provided in implementing PSE strategies as well as the ability to work with professionals such as Mark Fenton, a national public health, planning, and transportation consultant, as a result of this relationship with the state and national staff. Several Agents from Tennessee mentioned they were asked by state staff at the beginning of the project what “needs” and “wants” they may have in order to conduct PSE change through the High Obesity Project. These Agents were thankful the state staff listened to them and their request for program assistants and flexibility with project strategies. Having CES Program Assistants to help with the project was considered essential. Having a program assistant was contributed to allowing these Agents to maintain a proper balance of their other responsibilities as an FCS Extension Agent with the duties of the High Obesity Project and PSE work.

The table below includes selected quotes thought to best illustrate each developed subtheme (Table 2):

Table 2. Quotes by theme

Theme	Quotations
Subtheme 1.1: PSE requires more planning and time	<p>“...none of us probably ever recognized how much time it was going to take and how, um, all the rest of your programming just kind of fell to the wayside at different points in the time because I mean when you’re really focused on one particular area of PSE work, I mean, you’ve got a lot of dots to connect and a lot of time involved in”</p> <p>“...honestly between the number of conference calls trying to get the projects underway trying to get the coalitions to meet and the follow up with all of the emails from our campus team you couldn’t do any other work besides work...”</p>
Subtheme 1.2: Agents lacked direction	<p>“...we were fish out of water at first trying to find our way “what are we supposed to be doing”, um, people were telling us to go to the grocery stores and we were but we really didn’t know what we were trying to say, um, it really didn’t make sense at first so kind of just to educate, you know”</p> <p>“I had no clue like what was going on what I could do with the grant, I kind of knew what the grant was doing, you know, trying to target obesity and stuff in the rural counties but as far as like what I could do with the grant I felt like I didn’t really understand it until like a year later”</p>
Subtheme 1.3: Community collaboration proved difficult at times	<p>“... one of our small little local grocery stores did not want our assistance, did not want what we had to offer them, they were not willing to make the changes that we were putting on the table, um, so I consider that a barrier”</p> <p>“...right at the top of my head the biggest barrier that comes to mind is getting communication and getting things from those community partners”</p>
Subtheme 1.4: Frustrations with the specific project	<p>“...you can’t pay for concrete because something like concrete relates to labor and we knew we couldn’t pay for labor early on, you know, my county I could find a way to work around that because we have some resources but you cannot do that level of work in a county that doesn’t have, you know, extension funds to support it you don’t have community partners that have access to some dollars”</p> <p>“...didn’t want to say okay there’s x thousands of dollars given to each community or whatever but at the same time you also as an agent who is locally being the face of that project you needed to be able to say</p>

	<p>well I think, you know, we're going to have about \$20,000 to spend this year"</p>
<p>Subtheme 2.1: Development of partnerships proved important for PSE changes</p>	<p>"I think having the government, um, and county commissioners and officials, you know, supportive of the program, uh, was really a big help"</p> <p>"I would not have been able to do this myself obviously it was too big, and the community partners I didn't have a lot of them but the ones I did have I could count on"</p>
<p>Subtheme 2.2: Community support attributed to success</p>	<p>"I mean we just have a group of people who are the actual workers bees I guess is how I look at that and, um, and so they're willing to put projects in place and see them through from start to finish, um, if not we would have just had a bunch of stuff just granted to the county and just sitting around taking up space"</p> <p>"The actual things that we have placed within the county have not been a real problem, um, because my community people have taken care of it, when they were delivered they knew what to expect and what to do with it so"</p>
<p>Subtheme 2.3: Agent support from outside each community highly valued</p>	<p>"...it helps to know that there's somebody at UK to answer questions if I have a question, whether that be the specialists or the strategy leader or whatever, not necessarily about equipment or something that we're purchasing to put within the county with grant funds but just questions in general about PSE work"</p> <p>"...we're going to have to have program assistants in each county in order to be successful at this because we knew that the other work was going to continue and you don't want to compromise on the quality of that other work because now that the grant is over guess what you're back to the other work and if you've let all of that drop you're going to be rebuilding from the ground up and that's not what we wanted to do, um, two of us especially have spent too many years, um, with extension in order to let that happen"</p>

CHAPTER 5. DISCUSSION

5.1 Discussion

This study illustrated the experiences of FCS Extension Agents conducting PSE change related to healthy eating and physical activity in ten counties in Kentucky and Tennessee with obesity rates greater than the national average. The results indicate that these nutrition educators encountered several barriers as well as relied on certain resources while conducting PSE change which is a novel concept to a majority of those in the CES. The researchers were able to gain a rich understanding of the experiences of the Agents through the use of individual, semi-structured, in-depth interviews with participants. Research indicates that interviewing program leaders proves helpful in considering the contextual factors that may affect the process of a program in order to provide information for improvement and replication (Rychetnik, Frommer, Hawe, & Shiell, 2002; Leithwood & Montgomery, 1980).

This study found that most of the participants were experienced FCS Extension Agents with careers in the CES greater than ten years. Despite having experience in the CES, half of the Agents transferred into their High Obesity Project county during the project cycle. In general, FCS Extension Agents are not currently trained to a high degree on PSE change as only two Agents noted experience with the concept of PSE prior to being involved with the High Obesity Project. Research supports this conclusion that, up to this point in time, nutrition educators have been minimally exposed to the concept of PSE change (Smathers et al, 2019). This may explain the lack of direction, and concurrent feeling of being overwhelmed, the Agents felt regarding PSE strategies and the High Obesity Project. The Agents who were working in the High Obesity Project counties prior

to the start of the project discussed formal training they received, however, those that came to work in a High Obesity Project county during the cycle noted minimal formal training surrounding PSE change and their responsibilities for the project. This indicates the need for continued training and clarification on project specifications, the concept of PSE change, and available resources despite the total experience of a nutrition educator.

Discussion with Agents often circled back to the role the community had in successfully implementing PSE strategies, considering the community to be both a barrier and necessity. Agents felt they were able to be most successful when the individuals in their communities supported and encouraged the changes. In addition, the Agents greatly valued the partnerships that were created with community groups. Conversations with government officials, partners they had limited experience with such as the Department of Highways and other groups directly and indirectly related to nutrition and physical fitness. Other studies have also found the readiness of communities and formation of partnerships to significantly contribute to success of PSE strategies (Lu, Dickin, Conostas, & Dollahite, 2017; Cheadle et al, 2016). Although community support and partnership development proved very helpful, Agents still considered this collaboration to be a barrier at times.

Collaboration with community individuals and groups was noted as being difficult in several instances. Businesses that were suggested as important partners to work with, such as grocery stores, were not always receptive of what the Agents were asking of them. The owners or managers sometimes felt they may lose income as of a result of some of the healthy eating PSE strategies. One grocery store an Agent attempted to work with became frustrated with the slow communication and ordering process of equipment needed to implement these strategies and eventually refused to continue working with this Agent.

Community members who committed to help with certain tasks, especially labor, did not always cooperate. These findings suggest the need for additional training points for Agents on trouble-shooting communication and timeliness issues with community members and creating and maintaining beneficial partnerships. Community preparation training could also prove advantageous for nutrition educators doing PSE work. This training would be conducted with the community members to inform them on PSE change and the positive impact it will have on health and well-being, the length of time that may be needed to implement these strategies, etc. to improve cooperativeness and collaboration with the nutrition educators. Interestingly, the economic condition or demographics of communities were not mentioned as barriers though Kegler et al (2015) found these contextual factors to be significant in their research.

Agents also valued support from outside their communities including technical assistance, funding and a network of other Agents doing similar work. This study found that Agents greatly appreciated the guidance, handling of budgets and purchasing and ability to work with other professionals such as Mark Fenton, a national public health, planning, and transportation consultant, which was provided by state CES staff and CDC staff. Other research supports this idea of adequate Agent support allowing successful PSE change to be achieved (Kegler et al, 2015; Cheadle et al, 2016). Funding from the project was also considered a necessary resource by the majority of Agents. This finding is in opposition to another study which found funding to not be significantly related to increased use of PSE strategies (Lu, Dickin, Conostas, & Dollahite, 2017). The participating Tennessee counties had Program Assistants working alongside each FCS Extension Agent to support the duties of the Agent in conducting PSE work. The Tennessee Agents talked

highly of these Program Assistants and felt they would not have been able to balance all of their responsibilities if it were not for the extra staff.

The increased amount of planning and time that PSE work requires was a significant hurdle Agents had to overcome. In order to successfully implement PSE strategies, Agents had to conduct community assessments, spend many hours communicating with partners, research equipment and vendors, discuss these purchases with state staff, complete extra reporting, and be present for a multitude of meetings. Agents were concerned other county staff and their peers would not be understanding of this difference and view their lack of traditional programming as their inability to do their job well. The Agents who mentioned having Program Assistants did not view this as much of a concern because PSE work was the primary focus of the Program Assistant. As a result, the Agents were able to continue most of their other CES responsibilities as normal without sacrificing direct education programming. Ensuring adequate staff is accessible when doing PSE work is shown to be essential in maintaining a balance of duties. This may also prove helpful in reducing the feeling of being overwhelmed that was noted previously. This specific theme is a prominent finding as previous research has not yet surfaced this concern of nutrition educators in the realm of PSE change.

5.2 Limitations

Several limitations may impact the ability to generalize the findings of this study. The experiences of only ten total Kentucky and Tennessee FCS Extension Agents were examined which is a small sample size compared to the number of FCS Extension Agents across the country. In addition, these counties in which the participants worked were largely rural with obesity rates greater than the national average. This is not a

geographically or demographically representative sample of the entire country. The results of this study could not be generalized to urban populations or those without as great of an obesity prevalence. The sample for this study was already predetermined. The FCS Agents did not voluntarily choose to participate in the study but instead were recruited because of their involvement with the CDC 1416 High Obesity Project. The degree in which the FCS Extension Agents were involved in the High Obesity Project and PSE strategies in their communities also varied between the counties and states. The number of PSE strategies implemented and number of hours spent on the project were not addressed as part of this study. Additionally, separating the Agent's experiences with general PSE work from High Obesity Project requirements and stipulations was not always possible. The framing of PSE change from the CDC 1416 High Obesity Project may not be entirely representative of broader PSE strategies. It is acknowledged that the researchers of this study were unable to have another researcher present during the interviews to take notes.

5.3 Implications

The findings of this study will be used by nutrition educators and public health professionals in order to best prepare these individuals for success in replicating similar PSE strategies in their communities. Requirements to include PSE strategies as an approach to reducing obesity is becoming more prevalent for funding opportunities in settings outside of CES. CES projects similar to the CDC 1416 High Obesity Project will also benefit from understanding how the specific project guidelines and operations were perceived by the FCS Extension Agents to potentially alter future management. In addition, the findings will be used by state CES staff to inform the content being presented to FCS Extension Agents not involved with the CDC 1416 High Obesity Project at a two-

state training academy in the summer of 2019. The aim of this two-state training is to provide a large number of the FCS Extension Agents in these states with tools and best practices to initiate PSE change in their respective counties. This training will be intended for Kentucky and Tennessee FCS Agents, the sample population that was involved in this study. CES staff from other states across the country will be invited to this training to hopefully inform them of best practices that might apply to FCS Extension Agents in their states working to create PSE change.

5.4 Conclusion

This study contributes to the limited understanding of the barriers FCS Extension Agents face and the resources that best support them when implementing PSE strategies in rural counties with a high prevalence of obesity. The CES is an already established program working in counties across the United States to improve the health and well-being of the residents. This is being done by mobilizing FCS Extension Agents, respected nutrition educators in these counties. Limited research has been conducted surrounding the experiences of nutrition educators such as FCS Extension Agents working to create long-term, population-based change outside the level of individuals and families. The results of this qualitative study show that there is a need for additional training on PSE strategies, engaging the community and creating receptiveness surrounding PSE changes and fostering partnerships among FCS Extension Agents. The results also provided a backing for the development of a support network and problem solving related to issue with project guidelines to allow FCS Extension Agents to be successful in implementing PSE strategies in their communities.

Future studies with a larger sample size, participants from other states and including a more diverse population are needed to provide more generalizable results. It is also necessary to examine the experiences of FCS Extension Agents and other nutrition educators conducting PSE strategies outside of a specific funding mechanism like the CDC 1416 High Obesity Project. The specific funding source may have contributed to Agent experiences and perceptions of PSE. In addition, there is a need for the assessment of organization readiness and the value they place on PSE change. Agents are imbedded in the larger CES system and, therefore, their training, resources, and responsibilities are based on the ideas, opinions, and decisions of organization administrators.

APPENDICES

APPENDIX 1. INTERVIEW GUIDE

Interview introduction: *“You have been asked to participate in an in-depth interview with myself, Jordan Bressler, a graduate research assistant, because of your role as an FCS Cooperative Extension Service Agent in the CDC 1416 project. The purpose of this interview is to determine what resources were necessary for you to conduct policy, system, and environmental change related to obesity prevention in your communities. It is also to identify any barriers you may have encountered in conducting this work. The data will also be used to inform the training of other FCS Agents, in Kentucky and Tennessee, to be leaders of PSE work in their communities. This interview will last about an hour and will be audio-recorded. Please feel free to answer openly and honestly as your responses will be de-identified and kept confidential.”*

	Questions	Observations
Opening	1. Please tell me what county you work in and how long you have been an FCS agent for that county? How long have you been an FCS agent for any county?	
Introduction	2. What types of interventions do you think of when you hear the phrase “policy, system, and environmental” change, or PSE?	
	3. When did you first have an experience or training related to PSE work?	
Transition	4. Think back to when you first became involved with the CDC grant and PSE strategies. What was the beginning of the project like for you?	
Key	5. Think about the PSE strategies involved with the CDC grant. What were your first impressions?	

	6. How is your approach to PSE work different than your approach to other FCS roles?	
	7. Think about agency partners and influential people or organizations related to this project. In what capacity have you worked with these individuals/organizations?	
	8. What action plans have been developed and implemented? How have you evaluated the progress?	
	9. Is your community different as a result of the implementation of these strategies?	
	10. What has been particularly helpful in implementing the PSE strategies? What resources are necessary?	
	11. What has been particularly frustrating in implementing these strategies? What barriers have you encountered?	
	12. What did we not address in training you to do PSE work?	
	13. What has the end of the project been like for you?	
Ending	14. What advice would you give to other FCS agents doing this type of work?	

APPENDIX 2. CODEBOOK

Code	Definition	Files	References
COUNTY COLLABORATION	Agents consider relationships with partners and resources in their counties to be a main aspect of PSE; County and community partners were considered necessary resources and instrumental in implementing PSE strategies; Agents worked with other county groups or organizations and/or considered them to be key stakeholders (ie. Dept of Transportation, state and local park, director of commerce, tourism director, cities, jailer/prison)	10	75
COMMUNITY IMPROVEMENT	Agents see changes in their communities as a result of the PSE strategies (ie. reduced obesity rates, increased use of parks and equipment, infrastructure changes, drinking more water)	10	57
PSE REQUIRES MORE PLANNING & TIME	Compared to other FCS duties, Agents feel that PSE work requires more planning and effort including shopping trips, ordering and determining what to order, and fitting strategies to specific areas/partners; It took Agents more time to implement PSE strategies including researching supplies and equipment for ordering, assessing the community, building partnerships, completing paperwork, & being on conference calls	10	57
SOCIAL SERVICE COLLABORATION	Agents worked with various social service organizations in the county and/or considered them key stakeholders (ie. board of education, schools, hospital, YMCA, senior center, Kiwans, Lions Club, 4-H, library, churches, health dept, wellness center)	9	55

GOVERNMENT SUPPORT	Support from the local government (mayor, commissioners, officials) was considered to be very valuable during the CDC project; Agents worked with local government officials and/or considered them key stakeholders (ie. commissioners, mayors, magistrates, other elected officials)	10	44
COMMUNITY OPENMINDEDNESS	The open-mindedness and ability to be accepting of PSE strategies by the community and project partners was attributed to being helpful in implementing the PSE strategies; Community partners enjoyed, supported, and wanted to be involved in the CDC project and appreciated the efforts of the agent/project	7	40
MONEY	Money was said to be a necessary resource in implementing PSE strategies	9	36
PSE AS A NEW STRATEGY	Agents felt that PSE work was a new strategy for them versus their traditional role of programming, CDC project was first encounter with PSE strategies	9	31
POST PROJECT SUSTAINABILITY	Organizations have built off of the CDC project by applying for other funding to do PSE work in their communities and/or developed plans for strategy maintenance after project is complete	7	30
PROJECT ENJOYMENT	Agents enjoyed the project, feelings of reward	8	27
LACK OF FORMAL TRAINING	Little to no formal training conducted when agent transitioned into position with CDC project responsibilities	6	26
LACK OF CLARITY FOR AGENTS	Agents were unsure of what they were supposed to be doing exactly and/or what was allowed	7	25
OVERWHELMED WITH PROJECT	Upon the start of the project agents felt overwhelmed with the scope of the project including the amount of money they had to spend and challenged understanding the project	8	25
POPULATION BASED CHANGES	Agents consider PSE changes to be large-reaching such as at the county level	8	24

TECHNICAL ASSISTANCE	Agents valued the grant itself and the guidance provided by Extension staff in implementing PSE strategies	7	23
INVOLVEMENT BY OTHER COUNTY AGENTS	Ag, horticulture, or 4-H county agents were involved in some extent with the project such as assisting with specific programs, leading the project during a FCS agent gap, and/or training the new FCS agent	9	22
MOVERS AND SHAKERS	Community members and partners who have the willpower and ability to take action in their community and be key players in the CDC project or help the agent, agents value these individuals	6	22
EXPERIENCED AGENT	Agent who has served greater than 5 years in Extension including current county employed and any previous counties	7	21
AGENT RECEPTIVENESS OF PSE	PSE work aligns with the work already being conducted in Extension	8	20
LACK OF EVALUATION	Agents did not conduct or found it difficult to produce formal evaluations for implemented PSE strategies especially the outside activities/equipment	7	20
LEADER	Agents were the leaders in the county setting up coalition meetings and ensuring goals were established and met or felt they were the central person for the project	6	19
PURCHASING STIPULATIONS	Frustration expressed regarding the stipulations involved in the purchasing from vendors including not being able to use for installation and needing approval for everything	6	19
PROGRAM ASSISTANT	Agent viewed their program assistant as a valuable player in this CDC project	3	18
AGENT APPREHENSIVENESS	Agent concerned community and partners would not accept or find it difficult to understand PSE thinking and strategies	6	17

AGENT REMOVED FROM INSTALLATION PROCESS	Those receiving equipment were responsibly for installation and the Agent was not very involved in that process	6	17
BUDGET UNAWARENESS	Agents were unaware of the amount of money they had to spend which sometimes led to frustration	5	17
EXTENSION AWARENESS	Agent feels CDC project brought more attention to FCS and/or Extension in their county	5	17
NEW TO COUNTY	Agent who came into county during the grant cycle	5	17
AGENT FOCUS	Agent suggests keeping organized and a narrow focus on tasks to prevent spreading too thin and full effort into few tasks including spending time reading communications and other project information considered to be important in staying up-to-date with projects and collecting information from other staff & programs conducted	4	15
COMMUNICATION BARRIER	Agents felt communication with community members was a barrier in doing PSE work	3	15
LONG-TERM CHANGES	Agents consider PSE changes to be permanent and sustainable	5	14
MARK FENTON	Mark Fenton visited the county to provide assessments and feedback on environmental changes	4	14
RELIEVED PROJECT IS ENDING	Agent is at least partially glad the project is coming to an end or are over the project	4	14
LAST MINUTE PURCHASING	Money was left over at the end of the project so Agents had to quickly make purchases	4	13
LEARNING PROCESS	Agents had to spend time learning about certain activities and the CDC project to conduct PSE work and/or changing mindset from traditional programming to PSE implementation	7	13

BIG PICTURE OUTLOOK	Compared to other FCS duties, Agents feel that they have to look at the bigger picture of the county and community when doing PSE work	2	12
GAP IN FCS AGENT POSITION	County did not have an FCS agent in place at some point during the CDC project	4	12
LABOR DELAYS	Those who agreed to install equipment did not always install the equipment in a timely manner (ie. reminders to highway departments), sometimes related to need of equipment	4	12
STATE STAFF SUPPORT	State staff listened to the needs and wants of the agents that would be involved with the project including their ask for program assistants and flexibility with project strategies	2	12
COMFORTABLE COMMUNICATING WITH STAKEHOLDERS	Agent felt prepared to have conversations with government officials and other community stakeholders or became more comfortable having this conversations during the project	5	11
OBESITY	Agent views reducing obesity as a main goal of PSE work	6	11
CREATIVE THINKING	Agents felt they had to think outside of the box or differently when planning and implementing PSE strategies compared to traditional programming	2	10
PRESSURE	Agents felt this project caused them to feel more pressure from many avenues including the state staff and their community	2	10
PROJECT EXPECTATION TRAINING	Agents wished they would have been trained on the or given clearer guidelines of the CDC project and what specifically they were supposed to achieve and allowed to do	3	10
ADMINSTRATIVE DUTIES	Mentions that the project required a lot of paperwork and other administrative duties including reporting	3	9
AGENT SUPPORT NETWORK	Agents view the ability to ask others who have done PSE work to be valuable in doing PSE work or utilized this network	3	9

ALLOCATING RESOURCES	Agents wanted to spread the allocation of resources throughout the entire county which sometimes proved difficult	3	9
COMMUNITY CELEBRATION	Some form of celebration (ie. block party) was held by the FCS agent at the end of the grant cycle	3	9
EXTRA REPORTING	Agents felt that they were having to report things that were not necessary and/or they were unsure of how to complete the extra reporting	3	9
INEXPERIENCED AGENT	Agent with less than 5 years in Extension	3	9
BUDGET AWARENESS	Agent was aware of how much money they had to spend	4	8
LOCAL BUSINESS COLLABORATION	Agents worked with grocery stores in the county and/or considered them key stakeholders (ie. hardware stores, television station)	4	8
TIMING	The timing of the project and/or its components was attributed to being helpful in implementing the PSE strategies	3	8
COMMUNITY ASSESSMENT	Agent assessed the community and its members to determine preparedness, support, and/or reactions to PSE strategies that were about to be implemented	2	7
GROCERY STORE COLLABORATION	Agents worked with grocery stores in the county and/or considered them key stakeholders (ie. IGA)	4	7
LACK OF FUTURE PLAN	Agent or stakeholders do not have future plans for the use of equipment and other implemented strategies	4	7
PUSHBACK FROM PARTNERS	Not all partners were receptive of the work the FCS agents wanted to do through this project	3	7
EASE OF GOOGLE DRIVE	TN agents submitted their reports using Google Drive which reduced constant communication from the state staff and allowed them to complete reports at their own pace	2	6

INTIMIDATING SITUATIONS	When doing PSE work agents felt uncomfortable or unprepared in certain situations such as having conversations with government officials	2	6
SOLEY FCS ROLE	Agent with only FCS responsibilities for their county	2	6
WEATHER	Weather considered to have played a negative role in this project including installment of equipment taking additional time as a result of weather like equipment arriving in the winter	2	6
AGENT RECOGNITION	Agent feels it would be good for other agents and Extension as a whole to really understand what agents have had to do for this project	1	5
OPEN CONVERSATIONS	Agents need the ability to express their concerns and issues possibility with someone who has not been directly involved with the project	1	5
PROJECT PROMOTION	Agent feels it would be helpful for the community to be more aware of where the equipment and other changes came from (ie. the CDC project)	2	5
RIPPLE MAPPING MEETING	Ripple mapping meeting was said to bring together different partners by showing the opportunities to work together and future goals	1	5
STAFF TURNOVER	Staff turnover (at UK) was confusing for agents and/or may have been related to communication breakdown	2	5
STAKEHOLDER ENGAGEMENT TRAINING	Agent felt it would have been helpful to be training on how to involve more community partners and have conversations with such individuals/groups	2	5
CONSTANT PARTNER COMMUNICATION	Agents had high levels of communication with community partners	2	4

INCENTIVIZATION	Agents combined work with non-CDC project related programs (such as Healthier Tennessee) as motivation for partners to be involved in PSE strategies	1	4
LOSS OF INTEREST	Community members or partners became less involved with CDC project when they did not see quick results or the Agent did not have an immediate answer for them on something	1	4
COMMUNITY CELEBRATION FUNDING	State staff had budgeted an allotment for each TN county to have an end-of-project event	1	3
EASE OF PAPERWORK WRAP-UP	Agent did not feel that the end-of-project paperwork was overwhelming or required too much work	1	3
LACK OF INTEREST IN PSE PRIOR TO PROJECT	Agents did not make strong efforts to attend meetings and trainings related to PSE before knowing they would be involved in the CDC project	1	3
STAKEHOLDER DISAGREEMENT	Community members or partners have different ideas, opinions, and views	1	3
UNRELATABLE TRAINING	Some PSE training was geared towards larger, urban cities and less towards southern, rural communities	1	3
EVALUATION TRAINING	Agent suggested training on evaluation for FCS agents doing PSE work	1	2
NEGATIVE TIMING	Timing of projects and/or different components considered to be a negative including CDC project overlapping regarding timing and actual project components with projects other community partners were a part of	1	2
PREVIOUS PSE EXPERIENCE	Agent had prior experience with PSE work and community development type projects	2	2
COUNTY KNOWLEDGE	Relying on those living in the county to understand what the county needs and what strategies would be most helpful	1	1

APPENDIX 3. THEMATIC ANALYSIS GUIDE

1. **Familiarization.** Coder 1 becomes familiar with data by transcribing interviews verbatim and re-reading the transcriptions. Coders 2 and 3 will read the transcriptions and listen to the audio recordings if necessary.
2. **Generation of Initial Codes.** While Coders 2 and 3 are becoming familiar with the data, Coder 1 begins assigning short descriptions, or codes, to the transcript contents. To assign a phrase a code, the coder will highlight that phrase and add a 'New Comment' signifying the code assigned. The commenting functions can be accessed under the 'Review' tab in Word. If a code is assigned to other phrases in the transcripts, the phrase will again be highlights and the code placed in an attached comment box. The codes will be compiled into a codebook using Excel which will contain definitions of the codes, which interviews contained each code, notes for the codes and definitions, and quotes that represent the codes.
3. **Additional Coding.** Coders 2 and 3 will use the codebook created in step 2 to also code the interviews. To assign a phrase a code, the coder will highlight that phrase and add a 'New Comment' signifying the code assigned. The commenting functions can be accessed under the 'Review' tab in Word. If a code is assigned to other phrases in the transcripts, the phrase will again be highlights and the code placed in an attached comment box.
4. **Identification of Themes.** The codes generated in steps 2 and 3 will be collated into more broad themes based on the number of times they were used and their relation to other codes. Sub themes may be identified through this collation of codes under other themes. Some codes may not fit into any of the identified themes.
5. **Establishment of Themes.** After themes are identified, they will be reviewed and refined if necessary. These final themes will be given names and defined appropriately including what the theme is about, what is interesting about it, and why it is interesting.

Adapted from <https://www.interaction-design.org/literature/article/how-to-do-a-thematic-analysis-of-user-interviews> and Braun & Clarke reference

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VITA

Jordan Lynn Bressler, RD, LD

Education:

- Bachelor of Science in Dietetics, Coordinated Program
 - University of Kentucky, Lexington, KY, August 2016
- Master of Science in Nutrition and Food Systems (expected)
 - University of Kentucky, Lexington, KY, May 2019

Professional Positions Held:

- Teaching Assistant
 - Department of Dietetics and Human Nutrition, University of Kentucky, Lexington, KY, January 2019 to present
- Membership Chair
 - Hunger and Environmental Nutrition Dietetics Practice Group, July 2017 to present
- Research Assistant
 - Department of Dietetics and Human Nutrition, University of Kentucky, Lexington, KY, October 2017 to December 2018

Scholastic Honors

- 2018 Department of Dietetics and Human Nutrition Graduate Student of Excellence

Publications/Presentations

- Bressler J, Norman-Burgdolf H, Mullins J, Brewer D, Cardarelli K. (2019, April). Evaluating the Experiences of FCS Cooperative Extension Agents Use

of Policy, System, and Environmental Strategies to Reduce Obesity in Rural Counties. Center for Clinical and Translational Science Spring Conference, University of Kentucky, Lexington, KY.