IMPROVING DIETARY AND PHYSICAL ACTIVITY BEHAVIORS AMONG RESIDENTS IN A COMMUNITY-BASED RESIDENTIAL RECOVERY CENTER

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ABSTRACT

Residents in a community-based rehabilitation recovery center were noted to have poor dietary behaviors, both in part from their history of substance and/or alcohol use disorder and a lack of access to fresh produce. An interdisciplinary team implemented an evidence-based practice project to improve dietary behaviors and physical activity through a nutrition education program. Fresh produce donations were acquired from community food banks, allowing residents to practice their newly learned behaviors. The results of this program showed improvement in dietary behaviors, physical activity, and an increase in fresh produce consumption.

Keywords: *Substance rehabilitation unit, nutrition education, dietary behaviors, Expanded Food and Nutrition Education Program*

PURPOSE

Our project implemented an evidence-based practice intervention to improve dietary and physical activity behaviors among female residents seeking comprehensive treatment for substance and alcohol use disorders at a community-based residential recovery center (CRRC), through specific behavior changes and by providing increased access to healthy food options.

The specific characteristics and associated needs of those seeking care at the CRRC are unique. All were low-income females, with many having experienced homelessness. Most were challenged by the physical and mental adverse stresses of detoxing from substances and stress from the associated treatments of the initial and transitional stages of recovery (Mahboub et al., 2021). Individuals suffering from substance/alcohol use disorders regularly depend on sporadic and unhealthy meals of convenience (Mahboub et al., 2021; Neale et al., 2012). Initially, upon entering a recovery program, individuals may experience little to no appetite (Mahboub et al., 2021; Neale et al., 2012). The treatment for substance/alcohol use disorder, in conjunction with the treatment of the disproportionately high rates of mental health conditions within this population, can lead to weight gain and rebound appetite increase once the initial rehabilitative phase is over (Kelly et al., 2012; Mahboub et al., 2021; Neale, 2012). This can be particularly problematic in female patients in recovery due to the correlation between obesity and depression, skipping meals, bulimia, and risk of substance use relapse (Mahboub et al., 2021; Neale, 2012; Warren et al., 2013). Inadequate access to healthy foods can contribute to higher health disparities, frequently seen in patients with substance/alcohol use disorder (Chavez & Rigg, 2020; Evans et al., 2015).

Using nutrition courses during the recovery period of alcohol and substance use disorder leads to positive health outcomes, improved dietary behaviors, and reduced relapse rates (Cowan & Devine,

2012; Grant et al., 2004; Nour et al., 2018). Studies have found that individuals who attended nutrition education courses while in a substance recovery program reduced their daily intake of oils and fats, increased daily servings of vitamins, calcium, and fruit intake, and improved self-reported nutritional knowledge, attitudes, and practices (Clark et al., 2015; Cowan & Devine, 2012; Nour et al., 2018).

The clinical question posed at the start of this project was: Do residents of the CRRC have improved dietary and physical activity behaviors after the implementation of a nutrition education course and increased access to fresh produce? Because the CRRC identified an unmet need for healthy nutrition for the residents during their recovery, it was important to implement a sustainable program that could improve these behaviors. We researched interventions and planned a two-part project that would help address this gap. The first part of this project aimed at educating the residents about healthy food options and how to make positive dietary behavior changes. The Expanded Food and Nutrition Education Program (EFNEP), an evidence-based program, was implemented to accomplish part one. The second part was to ensure that while the residents were in recovery, they had the realistic ability to implement those behaviors by securing fresh produce donations from community food banks (see Appendix for logic model).

CONTEXT

Methods

Design

This was a pre/post-test project design based on outcomes reported by the CRRC residents before and after completing a nutrition education course. The goals of this project included an improvement in at least two of the five measured behavior domains on a validated and reliable 30-item self-reported questionnaire (diet quality, physical activity, food resource management, food security, and food safety) and increased fruit and vegetable intake based on a 24-hour diet recall.

This project was certified by the Washington State University Human Research Protection Program as Not Human Subject Research. All data were confidential and de-identified prior to analysis.

Frameworks

This project was grounded in Dorothea Orem's Theory of Self-Care (OSCT), which theorizes that individuals live healthier lives when they maintain responsibility for their own self-care. Empowerment and education are particularly important concepts in this theory (Hosseinzadeh et al., 2019; Regis College, 2021). Activities of self-care help individuals maintain their physical and emotional well-being, while promotion of self-empowerment increases self-confidence and the ability to provide self-care (Regis College, 2021). Proper nutrition and food preparation are some of the most fundamental self-care activities for adults (McLeod, 2018). By providing nutrition education, the residents at the CRRC had the opportunity to learn about healthy nutrition as well as practice new skills to enhance their diet quality and physical activity. These newly acquired knowledge and skills will empower them to make better food choices and, subsequently, take an active role in improving their health through proper nutrition.

The process framework used for this project was the Iowa Model. This framework, initially developed in 1994, guides practitioners in implementing evidence-based practices to improve health outcomes. Since its inception, revisions to the model have been executed to respond to the evolving nature of healthcare, the latest revision being in 2015 (Iowa Model Collaborative et al., 2017; White et al., 2019).

If a setting identifies a "trigger," such as a gap in clinical practice, then the Iowa Model is a commonly used framework to guide the practice change. The seven steps of the Iowa Model include selecting a topic, forming a team, evidence-retrieval, grading the evidence, developing an evidence-based standard, implementing the evidence-based practice, and evaluation (Iowa Model Collaborative et al., 2017). Pilot initiatives are encouraged within this model to determine if the practice change is appropriate and feasible for the setting (White et al., 2019).

Literature Review

An extensive literature review was completed using CINAHL, PubMed, and CAB Direct databases. Inclusion criteria were nutrition education programs specifically aimed at low-income populations, substance-use populations, and residential

recovery populations. A total of 23 articles were then reviewed for evidence-based practices. A synthesis of the literature concluded that nutrition education, provided in a group setting, improves nutritional knowledge and dietary behaviors in those attending residential substance rehabilitation centers (Cowan & Devine, 2012; Grant et al., 2004; Nour et al., 2018). A significant deficit was noted in the literature where female-specific participants were underrepresented; the studies focused overwhelmingly on male participants (Cowan & Devine, 2012; Curd et al., 2013; Nour et al., 2018). More recent literature was also noted to be a limitation, with many relevant articles being older than five years.

Setting

This project was implemented in a CRRC for females with a history of substance use disorder and alcohol use disorder. The CRRC is located in a mid-size city in the Inland Northwest and is operated by a regional, faith-based, non-profit organization. The center can house up to 25 female residents and accommodate children if needed.

Upon entering this center, the residents are enrolled in a structured 20-month program focusing on whole-person substance and alcohol recovery through educational, emotional, spiritual, social, and physical services. Although not a required condition for admittance to the program, more than 90% of the residents have a history of substance and/or alcohol use disorder. Other reasons for admission include interpersonal violence, poor life skills, and/or currently experiencing homelessness. All have experienced poverty, and all are on state Medicaid insurance. There is a high incidence of past trauma and mental health conditions.

A healthcare clinic is located within the center. It is staffed by volunteer nurse practitioners, registered nurses, and administrative assistants. Preventative services, urgent care, and mental health treatments are provided. Approximately 90% of the residents are on at least one mental health medication for depression, anxiety, and/or mood stabilization.

Three meals a day are provided to the residents during the weekdays. Before this project, much of the food donated to this specific CRRC was processed and canned, higher in refined carbohydrates, and in short supply of fresh fruits and vegetables. If produce was available and served, it was often of poor quality or expired, resulting in the residents only receiving one fresh produce per day. This is significantly less than the USDA's recommendation of 1.5-2 cups of fresh fruit and 2-3 cups of fresh vegetables per day (Lee et al., 2022).

Project Team

This was a collaborative, interdisciplinary, community engagement project facilitated by a Doctor of Nursing (DNP) student, two nurse practitioners (one of whom served as the faculty mentor), the Expanded Food and Nutrition Education Program (EFNEP) coordinator, and administrative staff at the CRRC. Stakeholders included the CRRC leadership team, staff, healthcare volunteers, residents, and donors.

Tools

Three measurement tools were used in this project. Two of the three tools were EFNEP evaluation tools used in a pre-post design where participants self-reported information by completing a 30-item behavior questionnaire and a 24-hour dietary recall.

The first EFNEP tool was the 30-item adult behavior questionnaire, a valid and reliable instrument that evaluates changes in food and physical activity behaviors (Murray et al., 2017; Murray et al., 2020). These behaviors are evaluated in five domain areas: diet quality, physical activity, food resource management, food safety, and food security.

The second EFNEP tool was a 24-hour dietary recall. Participants recorded the types and quantities of foods and drinks they consumed the previous day (Townsend & Wilson, 2016). Results from the dietary data include entry (pre) and exit (post) mean intake for fruits, vegetables, grains, protein, dairy, oils, solid fats, and added sugars. The dietary data also provides information about calorie and nutrient intake.

The third measurement tool was a produce log measuring this project's second part. This log indirectly measured if residents were applying their new behaviors in practice by documenting how much fresh produce was received on each delivery day and how much produce was served with each meal. The log was kept in the kitchen and completed by the CRRC chef.

Interventions

The first part of this project was implementing The Expanded Food and Nutrition Education Pro-

gram (EFNEP), a United States federally funded program administered by Extension staff through Land-Grant Universities. Since 1969, EFNEP has assisted over 33 million low-income families across all U.S. states and territories to acquire knowledge, skills, and attitudes to modify food and physical activity behaviors that contribute to their health and well-being (USDA, 2016). The program is delivered at established community partner sites, such as the setting for this specific project. Participants enrolled in EFNEP are required to be free-living; the residents at the CRRC were eligible for the program because they were preparing for the transition to live independently and prepare meals for themselves and their families. The EFNEP series are led by peer educators who belong to the communities they serve and have similar lived experience to EFNEP participants (USDA, 2016).

The EFNEP was delivered to all the residents over six weekly sessions at the CRRC. Each session was two hours long, covering nine lesson topics. The sessions were integrated into the residents' weekly schedule of classes, and all residents were expected to attend the sessions as part of their structured daily schedule. The EFNEP's *Eating Smart · Being Active* (ESBA) curriculum is an evidence-based program based on the Dietary Guidelines for Americans and is built on Adult Learning and Social Cognitive Theories. The ESBA curriculum effectively improves diet quality, physical activity, food resource management, and food safety behaviors among EFNEP participants (Auld et al., 2015). The curriculum is delivered by a trained EFNEP para-educator using the nationally approved EFNEP curriculum. Each class consisted of hands-on activities and discussion, a cooking demonstration, and a physical activity. Lesson topics in ESBA included: *Get Moving!* (physical activity), *Plan, Shop $*ave (food resource management), *Fruits and Veggies, Make Half Your Grains Whole, Build Strong Bones, Go Lean with Protein, and Make a Change* (choosing foods low in fat, sugar, and salt) (Baker et al., 2020).

Each resident completed the EFNEP 30-question adult behavior questionnaire and a 24-hour dietary recall at the first class (pre) and six weeks later at the last class (post). Data from these questionnaires were de-identified by the EFNEP coordinator using a unique five-digit number assigned to each resident.

The second part of this project was to ensure residents had the opportunity to use their newly learned behaviors while residing at the CRRC. This was accomplished through securing bi-weekly fresh produce donations from two community food banks. The DNP student initially collected these donations personally, but this activity was later transitioned to the CRRC staff for sustainability purposes.

Analysis

The 30-item adult behavior questionnaire and 24-hour dietary recall data were entered into the nationally used Web-Based Nutrition Education Evaluation and Reporting System (WebNEERS). Produce donations were logged for two and a half months and documented the quantity of produce received, the amount of produce served with each meal, and the estimated price of the produce. Data were analyzed using descriptive statistics to evaluate changes in food and physical activity behaviors and the impact of the food donations.

OUTCOMES

Results

Demographics

Fifteen residents (n=15) participated in and completed the EFENP program. All residents were women between the ages of 21 and 59. Seventy-three percent of the residents had between one and three children, and 93% of the residents reported being less than 50% of the poverty level, earning $13,875 a year or less for a family of four. Twenty-seven percent of the residents had not completed high school, 13% completed high school or had obtained a GED, 33% had some college education, and 27% had graduated from a two-year college.

Adult EFNEP Questionnaire

All 15 participants completed a pre-post 30-question adult behavior EFNEP questionnaire during the first and last EFNEP class. Fourteen of the fifteen participants improved in one or more behaviors across all domains measured on the questionnaire: diet quality, physical activity, food resource management, food security, and food safety. The most noted improvements were in diet quality, food resource management, and physical activity.

Eighty-seven percent of the residents showed improvement in one or more diet quality indicators. Forty-seven percent of the residents increased

their daily fruit intake, 20% increased their daily vegetable intake, and 40% decreased their regular soda intake. In the food resource management domain, 93% of residents showed improvements in one or more areas, with 40% reporting increased usage of food coupons, checking sales before shopping, and using a written food spending plan. In the physical activity domain, 73% of the residents reported improvement, including 33% of residents had an increase in at least 30 minutes of exercise per week and 20% reported an increase in making small changes to be active (see Table 1).

Dietary Improvements—24-hour Dietary Recall

All 15 participants completed a 24-hour dietary recall during the first and last EFNEP class. All residents had a mean positive change in at least one food group on their pre-post-24-hour recall. A decrease in solid fats and added sugars was noted in 83% of the residents, and a decrease in oil in 50%. Seventy-five percent of the residents reported an increase in vegetable intake, and 33% reported an increase in fruit and vegetables. An average increase in the amount of vegetables consumed and a decrease in calories consumed from oils, solid fats, and added sugars were observed (see Table 2). A decrease in fruit consumption was noted when looking at average serving size, while comparing the individual changes showed that 58% increased their fruit intake from pre to post. This was likely affected by outliers in a small sample size. Additionally, all three meals at the CRRC were prepared for the residents, which may have skewed the results of the dietary recall.

Access to Fresh Produce

All 15 participants received fresh daily produce. An estimated $1,912 worth of fresh produce was donated during two-and-a-half months. The produce log documented that fresh produce was served most days of the week and averaged approximately 1.4 fresh produce items daily over 35 days. The CRRC chef stated that most of the fresh donated produce was incorporated into each meal during the week, and little was wasted or discarded.

DISCUSSION

Our project illustrates the value of integrating nutrition education courses and increasing access to fresh produce to promote positive dietary behaviors in a specific population. Implementing an evidence-based practice project at a CRRC for low-income females with a history of substance/alcohol use disorder improved their daily dietary practices and increased their access to fresh daily produce.

The group class format offered by the EFNEP program provided an additional positive element to the treatment program's holistic approach to recovery. Residents had the opportunity to connect with each other in a way that differed from their normal daily routine. This was similar to a study showing that individuals enrolled in a group nutrition course while in a substance recovery program felt stronger social ties after completing the program (Curd et al., 2013). Continuing this program for future residents could offer that type of social connection and peer support.

Diet quality was the most improved behavior of the five domain areas on the behavioral questionnaire. Similar results were seen in the literature, where participants scored higher in this domain after completing the EFNEP program (Auld et al., 2015; Dollahite et al., 2014; Perkins et al., 2019). Results from two studies showed that EFNEP participants reported more fruit and vegetable intake post-completion of the program; an improvement in combined fruit and vegetable intake was noted among the CRRC on their post-24-hour diet recall (Auld et al., 2015; Dollahite et al., 2014).

Physical activity improved on the questionnaire results, which was also noted in the literature (Auld et al., 2015; Dollahite et al., 2014;). This domain can be particularly important in this population because of the association between regular aerobic physical activity and the reduction in anxiety, depression, and drug cravings (Abrantes & Blevins, 2019; Wang et al., 2019). A running club was initiated at the CRRC before the EFNEP started, which may have had a synergistic effect in this domain.

Access to fresh daily produce from community donations was critical to our project's success. Residents and the CRRC staff shared that residents were more likely to consume more produce during mealtimes, decrease the use of dressings to enhance flavors to produce, and find the meals more aesthetically pleasing. The ability to immediately utilize new behaviors acquired through an established, effective intervention such as the EFNEP makes sustainability of real behavior change in the long term more likely.

SUSTAINABILITY/RECOMMENDATIONS

Based on the favorable efficacy of the EFNEP course, the CRRC may consider continued implementation of the EFNEP course every 18-24 months. This 18–24-month timeframe would allow current residents to have a refresher EFNEP course prior to graduating from the program and allow new residents the opportunity to take the course. The CRRC leadership, staff, and residents recognized the importance of integrating nutritional teachings into recovery efforts and have expressed interest in continuing the course for future residents.

In addition to the EFNEP course, the CRRC should consider the addition of other evidence-based nutrition education and physical activity programs. The implementation of these courses could potentially further improve dietary and physical activity behaviors in the residents throughout their rehabilitation. This may lead to improvements in physical health, mental health, and drug abstinence rates (Cowan & Devine, 2012; Grant et al., 2004; Nour et al., 2018).

Bi-weekly fresh produce donations have continued. The food banks that supplied donations agreed to continue donations indefinitely. Without access to fresh produce, it would be nearly impossible for the CRRC residents to continue implementing what they learned from the EFNEP course into their dietary habits. As the most significant cost to the produce donation program is the transportation of the produce—estimated to be less than $5.00 per week—the CRRC should consider continuation of this donation program.

LIMITATIONS

There were limitations noted within this project. First, there were considerable inaccuracies and missing information on the "fresh produce served" log. The CRRC chef attempted to document the fresh produce served in the cafeteria daily, but frequently, fresh produce items were served and not recorded on the log. Additionally, the chef was not present on the weekends; therefore, no produce items served on the weekends were recorded on the produce served log. Thus, the fresh produce served log significantly under-represented produce served. However, per informal reporting by the CRRC chef, most of the donated produce was used.

Second, during the EFNEP course, the topics of food security and food resource management were discussed. As residents at the CRRC are provided with three meals per day and are not responsible for grocery shopping, the results from the food resource management and food security portion of the behavior questionnaire and 24-hour recall should be interpreted with caution. Additionally, because the residents are provided three meals per day, the results of the 24-hour dietary recall should also be interpreted with caution. Food choices are largely based on what the chef prepares with some assistance from residents. However, the fresh produce donations allowed for healthier meals and likely contributed to increased produce consumption. The EFNEP course may have also enabled the residents to make better-informed choices about their food selection.

Lastly, the sample size was small. Because of this small sample size, the intake and number of servings could be easily influenced by outliers on the 24-hour diet recall. Furthermore, the behavior questionnaire and the 24-hour diet recall were self-reported, which could have impacted the results to some degree.

REFLECTIVE CRITIQUE

Washington State University is a Land-Grant University whose mission is to promote community engagement throughout Washington State and beyond by applying knowledge and skills that promote quality of life (Washington State University, 2015). This project defined that concept, recognizing an unmet need in our community that was affecting the quality of life among a specific, vulnerable population. Through collaborative efforts with Washington State University's EFNEP extension office, the DNP student and faculty were able to accomplish outreach services to this specific community, help bridge gaps in practice, and promote community partnerships with local food banks. Continuing these outreach programs can have sustainable impacts on the community and the university.

FACULTY REFLECTION

This was my first time serving as both faculty and site mentor to a student for a clinical project. The project occurred where I practice clinically, and initially, I was slightly uncertain about having a student with me on my clinic day. Although

I recognized the gap in nutrition resources at the CRRC and its impact on the residents, I saw my clinic day as a day to be a clinician and not a faculty member. However, as the project began to take its course and the student began to grow in her leadership skills, I was struck by what a transformation had happened at the CRRC and in my own professional growth.

For the past three years, I have lectured about the correlation between social determinants of health and the health inequities of underserved communities but have had limited opportunities to involve my students in active community engagement. That was a limitation on my part because I did not know the logistics of bridging my academic world with my clinical world. This project afforded me the chance to bridge my own gap in practice.

Interdisciplinary partnerships within a college/university or with community agencies can allow our students thoughtful and rewarding academic opportunities. These opportunities can help promote positive changes and lessen the disparities faced by many within our communities. As faculty, we can help lead our students to serve in communities around us and strive to make the changes we envision for improved outcomes and equity.

PROGRAM COORDINATOR REFLECTION

Building a partnership with the College of Nursing through this community engagement project increased EFNEP's outreach to low-income women in recovery. When planning and evaluating EFNEP classes, I rely on community partners' relationships with participants to assist in recruitment and retention efforts. The women were excited to participate and continue with the EFNEP series because of the trust the nursing faculty member and student fostered in their patient-provider relationship.

While extension programs are delivered through Land-Grant Universities, we often are disconnected from other colleges and university programs because of geographic distance and lack of knowledge of other programs and research. In the future, I will continue to partner with health science programs such as the College of Nursing to build a bridge between university and community resources.

STUDENT REFLECTION

One of the most significant successes of this project was the amount of fresh produce donations obtained weekly and then utilized in the CRRC kitchen. Initially, getting fresh produce items posed a challenge. I started by asking major chain grocery stores for fresh produce donations; however, most of the chain grocery stores did not offer donations directly. Instead, lengthy paperwork was required to be completed and sent to their headquarters, where a decision would be made. Fortunately, I had great success securing fresh produce using the local food bank system. I visited a variety of local food banks, which allowed me to make important networking connections and establish a presence within the local food bank community. This ultimately enabled me to get a significant amount of fresh produce weekly for the RLRU. Some weeks, I was offered so much produce that I had to decline some because it was more than could be used.

One critical component to the success of this project was the CRRC chef, who was motivated and interested in implementing healthier food items using fresh produce. The CRRC chef did an excellent job incorporating fresh produce items into every meal and ensuring that the fresh produce items were being used in each meal with little to none going to waste.

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Appendix

Logic Model

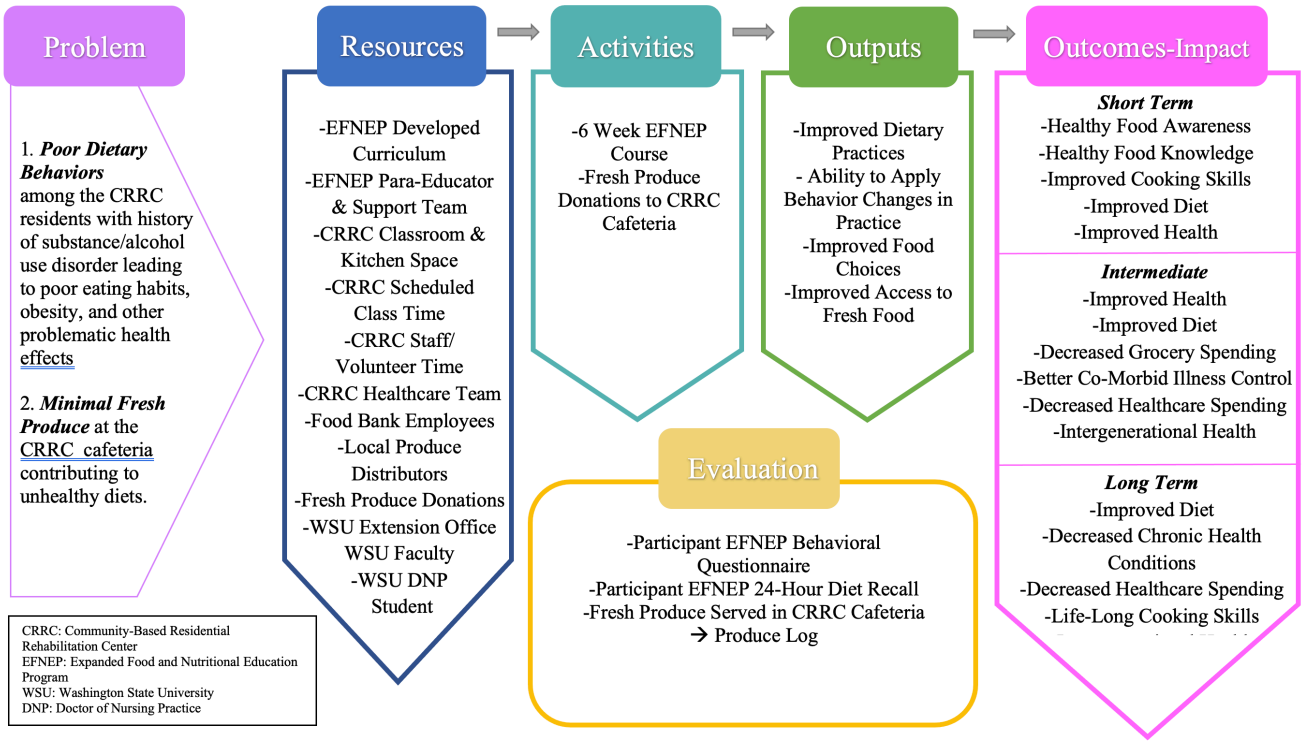

Table 1.

Participant Improvement (%) in Diet Quality, Food Resource Management, and Physical Activity Domains

Select Topics and Questions from EFNEP Questionnaire	Number of Participants who Improved	% of Participants who Improved
Diet Quality		
Eat fruit more often each day?	7	47%
Eat vegetables more often each day?	3	20%
Drink regular soda less often?	6	40%
Physical Activity		
Exercise for at least 30 minutes more days a week?	5	33%
Make small changes to be active more often?	3	20%

n= 15 participants

Table 2.

Dietary Changes in Fruits, Vegetables, Fats, and Sugars Based on a Self-Reported 24-hour Dietary Recall

Category	Pre-Intake Mean	Post-Intake Mean
Fruits	2.1 Cups	1.5 Cups
Vegetables	1.2 Cups	2.7 Cups
Fruits and Vegetables	3.2 Cups	4.2 Cups
Oils	31.6 Grams	30.8 Grams
Solid Fats and Added Sugars	991 calories	300 calories

n= 15 for each group