

**UNDERSTANDING THE PROCESS AND KEY FACTORS OF
COMMUNITY IMPLEMENTATION OF A FOOD STORE-BASED
NUTRITION INTERVENTION ON THE NAVAJO NATION**

by
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ABSTRACT

The prevalence of obesity is significantly higher among American Indians (AI) than in other racial/ethnic groups and is associated with increased rates of diabetes, hypertension, and cardiovascular disease. In rural AI settings, accessibility, availability and variety of healthful foods are limited. Changing the food environment in these AI communities may be a feasible way to impact diet quality and reduce obesity and chronic disease risk. The Navajo Healthy Stores (NHS) program was a food store-based intervention implemented through an academic–community partnership to improve dietary patterns on the Navajo Nation and to reduce risk for obesity. This dissertation describes the partnership process and key factors affecting the implementation and sustainability of the NHS program.

A qualitative study was conducted using a combination of semi-structured interviews with key stakeholders and a review of program documents. We found that the academic-community partnership for implementation of the NHS program evolved through an engagement, formalization, mobilization, and maintenance process, but there were important challenges needed to address in order to successfully move through the stages of implementation. Key challenges faced by the partnership included fitting into local health staff job schedule, obtaining buy-in from critical stakeholders, and overseeing implementation within the host organization. We also identified important facilitating factors for the partnership effort, including trust in the academic partners' experience and commitment to sustainability, being responsive to the partner's interests in capacity development, having a program champion, and having a dedicated and

experienced field coordinator. Our study also found that local health staff was able to work with store owners/managers to implement the NHS intervention, but there were challenges in delivering intervention activities with adequate intensity and having store owners to stock healthier options. Small store managers reported lack of customer demand, lack of availability and increased cost of healthy foods from suppliers due to long transportation route as key challenges for stocking healthy foods.

The findings of this study help guide academic researchers and community practitioners in developing effective partnerships for community implementation of evidence-based nutrition interventions.

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CHAPTER 1. INTRODUCTION

1.1 PROBLEM STATEMENT

Growing research on the relationship between food environments, dietary intake, and obesity risk suggests a need for effective strategies to improve food environments in various settings (Sallis & Glanz, 2009; Story, Kaphingst, Robinson-O'Brien, & Glanz, 2008). In recent years, retail food stores in underserved communities have become important venues to improve the availability of and access to healthy foods and to promote healthy food choices (Flournoy & Treuhaft, 2005; Glanz & Yaroch, 2004; Sallis & Glanz, 2009; Seymour, Yaroch, Serdula, Blanck, & Khan, 2004). There is sufficient evidence for effectiveness of store-based interventions in improving food-related behaviors through the combination of demand- and supply-side strategies (Escaron, Meinen, Nitzke, & Martinez-Donate, 2013; Gittelsohn et al., 2012b). It is expected that the wide-spread dissemination and implementation of effective store-based environmental interventions at the local level can produce public health impact on obesity and chronic disease prevention over the long term (CDC, 2009).

However, research on the dissemination and implementation of effective nutrition interventions in community settings is scarce. Dissemination defined as a planned process of actively spreading evidence-based interventions to the target audience via determined channels, and implementation is defined as the process of putting to use or integrating evidence-based interventions within a setting by undertaking a specific set of activities (Fixsen, Naoom, Blase, Friedman, & Wallace, 2005; Rabin, Brownson, Haire-Joshu,

Kreuter, & Weaver, 2008). The process of implementation can be categorized into four stages: exploration and adoption, program installation, implementation, and sustainability (Fixsen et al., 2005). Previous research on the dissemination and implementation of evidence-based nutrition interventions in community settings (A) was primarily guided by diffusion theory, (B) primarily used a top-down approach to dissemination and implementation, and (C) focused on school-based interventions (Ciliska et al., 2005; Rabin, Glasgow, Kerner, Klump, & Brownson, 2010). Diffusion of Innovation theory (Roger, 2003) explains the process by which an innovation is adopted by the target audience, and has served well in variable- and dissemination- focused studies (Dearing, 2008). However, the application of diffusion theory has been limited in research on implementation that place greater attention on the process and how-to-knowledge as well as users of evidence-based interventions (Green, Ottoson, Garcia, & Hiatt, 2009; Tabak, Khoong, Chambers, & Brownson, 2012). Despite the prevalence of obesity and chronic disease is disproportionately higher in racial and ethnic minority populations (Kumanyika & Grier, 2006; O'Connell, Yi, Wilson, Manson, & Acton, 2010; Ogden et al., 2006; Wang & Beydoun, 2007), previous studies rarely examined the dissemination and implementation of evidence-based nutrition interventions in minority population or communities. Participatory research approach, in particular Community-based Participatory Research (CBPR) have been considered as an effective approach for working with minority and underserved populations (Cargo & Mercer, 2008; Stacciarini, Shattell, Coady, & Wiens, 2007; Wallerstein et al., 2008). However, the potential of

CBPR for dissemination and implementation of evidence-based interventions has yet to be explored (Glasgow, Green, Taylor, & Stange, 2012; Wallerstein & Duran, 2010).

This dissertation aimed to address these gaps in the literature by examining the implementation process of a store-based nutrition intervention on the Navajo Nation guided by the frameworks or models of participatory research and stages of implementation process. The goal of this dissertation was to understand the process and key factors of community implementation of a food store-based nutrition intervention through an academic-community partnership. The specific aims of this study and research questions to be addressed are as follows:

1. To examine the academic-community implementation partnership process:
 - 1.1 How was the implementation partnership formed and how did it evolve?
 - 1.2 What were strategies used by the partnership to implement and sustain the program?
 - 1.3 What were key challenges for the implementation partnership?
2. To identify key factors affecting the academic-community partnership effort:
 - 2.1 How and what factors have facilitated the partnership effort to implement and sustain the program?
 - 2.2 How and what factors have hindered the partnership effort to implement and sustain the program?
3. To understand challenges in community implementation of the program from the perspectives of local health staff and food store owners:

- 3.1 What challenges were faced by local health staff in recruiting food stores and working with store owners?
- 3.2 What challenges were faced by store owners in participating in the program?
- 3.3 What were store owners' perceptions about the program and its implementation by local health staff?

1.2 SUMMARY OF DISSERTATION CHAPTERS

This dissertation is composed of seven chapters. Following this introduction, chapter 2 provides an overview of obesity, diet quality, food environment in American Indian communities and food store-based interventions to improve access to healthy foods. This chapter also summarizes research on the dissemination and implementation of evidence-based nutrition interventions in community settings. Chapter 3 describes the study design, data collection methods, and analytical approaches used.

Chapter 4 (Paper 1, target journal: American Journal of Preventive Medicine) presents the six key steps and strategies used by the collaborative partnership between Johns Hopkins University Center for Human Nutrition and Navajo Special Diabetes Project to implement and sustain the NHS program. Chapter 5 (Paper 2, target journal: American Journal of Public Health) examines factors that facilitated the academic - community implementation partnership and barriers that hindered the partnership process. Chapter 6 (Paper 3, target journal: Health Promotion Practice) describes the implementation of the NHS program from the perspectives of local health staff (as interventionists) and store owners/managers, in terms of store recruitment, relationship

building, and challenges in delivering the intervention. In addition, storeowners' perceptions about the program, its implementation by local health staff, and program effectiveness are presented.

Finally, chapter 7 summarizes the main findings of the study and discusses study strengths and limitations. This chapter also provides suggestions for future practice, policy, and research.

CHAPTER 2. LITERATURE REVIEW

This chapter provides an overview of obesity, diet quality, food environment in American Indian (AI) communities, food store-based interventions to improve access to healthy foods, and research on dissemination and implementation of evidence-based nutrition interventions in community settings.

2.1 OBESITY IN AMERICAN INDIANS

Obesity affects AI children and adults in a higher proportion than any other racial/ethnic group. Data from the Racial and Ethnic Approaches to Community Health (REACH) 2010 project shows obesity prevalence is 40.1% for AI men and 37.7% for AI women compared to that of Black (26.5% and 37.6%), Hispanics (26.6% and 28.4%) and Asian (2.7% and 3.1%) (Liao, Tucker, & Giles, 2003). AI children tend to become overweight in early childhood compared to all race national averages (CDC, 2005), and the high rate of overweight occurs as early as elementary school ages (Caballero et al., 2003; Neol, 2003; Zephier, Himes, Story, & Zhou, 2006). The high prevalence of obesity in AI is associated with increased rates of chronic diseases, such as type II diabetes, hypertension, cardiovascular disease and gallbladder disease (Compher, 2006; Slattery et al., 2010; Acton et al., 2002).

2.2 DIET QUALITY IN AMERICAN INDIANS

Poor diet quality is widely recognized as one of the major causes of obesity among AI along with physical activity, genetic, psychosocial, and socioeconomic factors

(USDHHS, 2007). There has been a dramatic shift in the AI diet in the past few generations from a traditional low-fat, high fiber diet to a high-fat and high-sugar Western diet that are associated with obesity development (Compher, 2006; Jackson, 1986). Traditional foods are relatively absent from the diet and a greater proportion of food is store-brought, processed and commercially prepared (Taylor, Keim, & Gilmore, 2005). Fruit and vegetable consumption is very low, and only a low proportion of the population meets recommendations for fruit, vegetable, dairy, and micronutrient consumption (Ballew et al. 1997; Costacou, Levin, & Mayer-Davis, 2000; Harnack, Sherwood, & Story, 1999; Sharma et al., 2007, 2010). Sweetened beverages are a leading source of energy intake among AI (Sharma et al., 2007; Wharton & Hampl, 2004).

2.3 FOOD ENVIRONMENTS IN AMERICAN INDIAN COMMUNITIES

There is limited literature on the food environment in AI communities. Findings from existing studies indicate that the retail food environment plays a key role in limiting access to and availability of healthy foods in AI settings (O'Connell, Buchwald, & Duncan, 2011; Odoms-Young, Zenk, Karpyn, & Ayala, 2012; Pareo-Tubbeh, Shorty, Bauer, & Agbolosoo, 2000). Most AI reservations are rural, and have limited access to diverse food outlets (Gittelsohn & Sharma, 2009). Large supermarkets are rare on most AI reservations, and most AI are dependent on convenience or gas-station stores, which primarily stock unhealthy snack foods and rarely carry fresh produce, and offer a range of ready-to-eat foods (Gittelsohn & Sharma, 2009; Gittelsohn & Rowan, 2011).

2.4 FOOD STORE-BASED INTERVENTIONS

In the U.S., a number of studies have shown that the availability of retail food stores (e.g., supermarkets and grocery stores) that offer a quantity of affordable healthy food in ‘neighborhoods’ (definitions and boundaries vary among studies) is associated with healthy eating (e.g., higher intake of fruits and vegetables) and lower rates of obesity among residents (Black & Macinko, 2007; Larson, Story, & Nelson, 2009; Sallis & Glanz, 2009; Story et al., 2008). Some studies have observed that communities of color, low income, and minorities in the U.S tend to have less access to supermarkets and more access to smaller stores that offer no or limited selections of healthy food (Black & Macinko, 2007; Larson et al. 2009; Sallis & Glanz, 2009; Story et al., 2008; Treuhaft & Karpyn, 2010). Thus, retail food stores in underserved communities have become important venues for environmental interventions to improve the availability of, access to, and purchasing of healthy food (Sallis & Glanz, 2009; Glanz & Yaroch, 2004; Gittelsohn et al., 2012b; Seymour et al., 2004).

Store-based environmental approaches to improve the availability of and access to healthy food in underserved communities consist of two primary approaches: developing new supermarkets/grocery stores and improving the selection and quality of food in existing smaller stores. Each approach has unique benefits and challenges (Flournoy & Treuhaft, 2005). Although strategies, such as offering financial incentives (e.g., tax credits, grant and loan programs) and using zoning regulations (e.g., “as of right” and “conditional use permits”), have been identified to be promising (IOM & NRC, 2009; Karpyn et al., 2010), developing new supermarkets involve a lengthy, complex

process and may not be feasible in many communities (Bolen & Hecht, 2003; Flounoy & Treuhaft, 2005; IOM & NRC, 2009). Improving the availability of healthy food through existing smaller neighborhood stores can be a viable approach in communities (i.e., low income, inner-city and rural communities), with no or limited access to supermarkets and grocery stores (Bodor, Ulmer, Dunaway, Farley, & Rose, 2010; Flounoy & Treuhaft, 2005; IOM & NRC, 2009).

To improve access to healthy food choices through existing smaller stores, there are several promising strategies, such as offering financial incentives, connecting with small business development, linking with wholesale distributors and local farmers, and providing training, technical assistance and other forms of marketing and promotion support (Flounoy & Treuhaft, 2005; Gittelsohn et al., 2012b). While promising, working with existing neighborhood stores faces many challenges that may vary from store to store, community to community, and rural areas versus urban areas (Flounoy & Treuhaft, 2005; Gittelsohn & Sharma, 2009). The limited literature shows the feasibility of some strategies (e.g., offering financial incentives and providing training and technical assistance for store owners) in underserved communities, and modest success of such strategies (often in combination with point-of-purchase information and community social marketing) in store sales or neighborhood purchase of promoted healthy food items (Bodor et al. 2010; Burtness, 2009; IOM & NRC, 2009; Gittelsohn et al., 2012b).

There are four types of food store-based interventions: (1) provision of Point-of-Purchase (POP) information, (2) reduced prices and coupons, (3) increased availability, variety, and convenience of healthier foods, and (4) promotion and advertising (Escaron

et al., 2013; Glanz & Yaroch, 2004). POP information includes shelf labels and/or signage that specifies healthy food choices based on established criteria, and is often combined with food demonstrations, taste testing, and other printed materials (such as posters, brochures, and/or fliers). Reduced prices and coupons involves reducing price and providing coupons for healthy food choices and/or fruits and vegetables.

Interventions based on increased availability, variety, and convenience aim to provide more healthy food choices through various venues. Promotion and advertising strategies use newspaper inserts, multimedia advertising, games, posters, and other communication media to announce and encourage consumption of healthy choices. There is strong support for the feasibility of these approaches (Glanz & Yaroch, 2004). There is also evidence demonstrating the increased effectiveness combining these strategies (Escaron et al., 2013). These combinations include POP information and promotion and advertising; POP information, increased on increased availability of healthy foods, and promotion and advertising; POP information, pricing, increased availability of healthy foods.

The success of interventions focusing on changing the food store environment depends largely on engaging store owners/managers. Storeowners' views on the opportunities and barriers for increasing the supply of healthy foods are critical to developing effective intervention strategies (Flournoy & Treuhaft, 2005; Gittelsohn et al., 2006, 2010b; Larson et al., 2013; Public Health Law & Policy, 2009; Song et al., 2012). Furthermore, store owners can provide important insights about implementation successes and challenges that are crucial for successful outcomes and program

sustainability (Adams et al., 2012; Dannefer, Williams, Baronberg, & Silver, 2012; Gardiner et al., 2013; Gittelsohn et al., 2012a; O'Loughlin, Ledoux, Barnett, & Paradis, 1996; Rosecrans et al., 2008; Song et al., 2011). Effective communication and skillful coordination between program staff and store owners are essential for engaging store owners and sustaining their participation (Gardiner et al., 2013; Song et al., 2011).

The majority of small-store intervention trials to date have been conducted in low-income, urban settings (Gittelsohn et al., 2012b). A few food store interventions have been conducted in AI communities. The Zhiwaapenewin Akino'Maagewin (Ho et al., 2008; Rosecrans et al., 2008) and Apache Healthy Stores (Curran et al., 2005; Vastine, Gittelsohn, Ethelbah, Anliker, & Caballero, 2005) programs showed positive changes in individual knowledge, and the frequency of healthy food acquisition. Changing the food environment in AI communities may be a feasible way to improve diet quality and reduce obesity and chronic disease risk (Gittelsohn & Rowan, 2011).

In summary, retail food stores in underserved communities have become important venues to improve the availability of and access to healthy foods and to promote healthy food choices (Flournoy & Treuhaft, 2005; Glanz & Yaroch, 2004; Sallis & Glanz, 2009; Seymour et al., 2004). There is sufficient evidence demonstrating effectiveness of store-based interventions in improving food-related behaviors through a combination of demand- and supply-side strategies (Escaron et al., 2013; Gittelsohn et al., 2012b). However, implementing and sustaining multi-component store-based interventions in the real world is challenging and requires continuing evaluation and surveillance to ensure the intervention effectiveness (Glanz & Yaroch, 2004).

2.5 RESEARCH ON DISSEMINATION AND IMPLEMENTATION OF EVIDENCE-BASED NUTRITION INTERVENTIONS IN COMMUNITY SETTINGS

Systematic reviews of population- and community-based nutrition interventions indicate that nutrition interventions can achieve modest positive changes (e.g. in reducing fat intake and increasing fruits and vegetables intake) in the general population in the short term (Bowen & Beresford, 2002; Ciliska et al., 2000; Seymour et al., 2004; Thorogood, Simera, Dowler, Summerbell, & Brunner, 2007; WHO, 2009). It is expected that wide-scale dissemination and implementation of effective nutrition interventions can produce population-level impacts in the long term (Thorogood et al., 2007). However, research on the dissemination and implementation of effective nutrition interventions in community settings is scarce. Dissemination may be defined as a planned process of actively spreading evidence-based interventions to a target audience or other key stakeholders via determined channels. Implementation is defined as the process of putting to use or integrating evidence-based interventions within a setting by undertaking a specific set of activities (Fixsen et al., 2005; Rabin et al., 2008). The process of implementation can be categorized into four stages: exploration and adoption, program installation, implementation, and sustainability (Fixsen et al., 2005).

A review of dissemination and implementation of nutrition interventions for cancer prevention among adults identified only seven distinct studies, published between 1980 and 2002, even though all primary studies were eligible for inclusion regardless of study designs (Ciliska et al., 2005). Of those seven studies, only one study examined the

dissemination of a nutrition intervention in community settings (Patterson et al., 1998). In a complementary review updated with studies published between 2002 and 2008 and interventions for children and adolescents, Rabin et al (2010) identified five additional studies on the dissemination and implementation of nutrition interventions in community settings. The researcher also identified two additional studies (Harvey-Berino, Ewing, Flynn, & Wick, 1998; Naylor et al., 2010) that were not included in these two reviews. The main components related to dissemination and implementation were summarized in Table 2.1 and discussed below.

2.5.1 Interventions and Target Audiences

The dissemination and implementation of seven distinct interventions was examined in eight studies, including two studies that examined one intervention under two different settings at different time points (Heath & Coleman, 2003; Hoelscher et al., 2001). Of these seven distinct interventions, four were academic-derived interventions (Harvey-Berino et al., 1998; Heath & Coleman, 2003; Hoelscher et al., 2001; Patterson et al., 1998; Wiecha et al., 2004), and three were developed and disseminated in partnership with provincial, state or regional agencies or organizations (Nanney et al., 2007; Naylor et al., 2010; Olson, Devine, & Frongillo, 1993). The dissemination and implementation of academic-derived interventions was initiated either by the research teams after the completion of efficacy trials (Patterson et al., 1998; Wiecha et al., 2004), or in response to the demands from state agencies or local organizations (Harvey-Berino et al., 1998; Heath & Coleman, 2003; Hoelscher et al., 2001). The majority of the interventions (5 out of 7) were school-based programs or curriculums. Only two of the eight studies examined

the dissemination and implementation of an intervention in minority populations or communities (Heath & Coleman, 2003; Naylor et al., 2010).

2.5.2 Dissemination and Implementation Strategies and Theoretical Models

Main dissemination and implementation strategies reported in these studies include training, technical assistance, or consultation from the original research team, financial support, and provision of program protocols and materials. These strategies were applied in various combinations in different studies. One study also reported developing implementation plans through an action committee and allowing flexibility to fit specific organizational needs (Heath & Coleman, 2003). Two studies used community-participatory research approach (CBPR) (Naylor et al., 2010; Wiecha et al., 2004). Six of the eight studies reported that Diffusion of Innovation Theory (Roger, 2003) guided the dissemination efforts, and only one study described in detail how the theory guided specific dissemination strategies (Hoelscher et al., 2001). Two studies did not mention any theoretical guidance for dissemination and implementation.

2.5.3 Implementation and Sustainability

Six studies reported the level of implementation, indicated by either the number or the percentage of target audiences that actually used program materials, or the percentage of meeting the intended intervention activity goals (dose delivered or dose exposed). Various degrees of implementation success were observed. One study evaluated the effects of different strategies on implementation (implementation with or without external training support, and implementation with or without grocery store link) (Harvey-Berino et al., 1998). Most studies examined factors associated with

dissemination and implementation, including the characteristics of the interventions and the adopters and the availability of adequate training, resources and financial support. Only two studies reported the findings from outcome evaluations (Coleman et al., 2005; Devine, Olson, & Frongillo, 1992). Although positive findings were reported for individual level outcomes, such as nutrition attitudes and behavior and body weight, the response rates were low in both studies. Sustainability of intervention was reported in only one study (Wiecha et al., 2004).

2.5.4 Gaps in the Literature

In summary, previous research on the dissemination and implementation of evidence-based nutrition interventions in community settings was primarily guided by diffusion theory, used a top-down approach to dissemination and implementation, and focused on school-based interventions. Diffusion of Innovation theory (Roger, 2003) explains the process by which an innovation is adopted by the target audience, and has successfully guided variable- and dissemination- focused studies (Dearing, 2008). However, the application of diffusion theory has been limited in implementation research (Green et al., 2009). This may explain why data on implementation is cross-sectional and limited, but factors, such as the characteristics of the interventions and the adopters have been examined extensively in prior research. There is a need to incorporate constructs from other related theories or models that focus more on implementation and sustainability (Tabak et al., 2012). To our knowledge, only two studies have examined the dissemination and implementation of evidence-based nutrition interventions in minority population or communities, despite the prevalence of obesity and chronic

disease is disproportionately higher in racial and ethnic minority populations (Kumanyika & Grier, 2006; O'Connell et al., 2010; Ogden et al., 2006; Wang & Beydoun, 2007).

Only two studies reported using Community-based Participatory Research (CBPR) approach. The full potential of CBPR for dissemination and implementation of evidence-based interventions has yet to be explored (Glasgow et al., 2012; Wallerstein & Duran, 2010), and may be particularly effective for working with minority and underserved populations (Cargo & Mercer, 2008; Scarinei et al., 2007; Wallerstein et al., 2008).

This dissertation aimed to address these gaps in the literature by examining the implementation process of a store-based nutrition intervention on the Navajo Nation guided by frameworks derived from participatory research and by examining stages of implementation process.

Table 2.1. Summary of research on the dissemination and implementation of evidence-based nutrition interventions in community settings

Study	Intervention	Target audience /setting (location)	Dissemination and implementation strategy	Theory/model used	Implementation	Sustainability
Olson et al., 1993 Devine et al., 1992	Nutrition education curriculum	Teachers/ school (New York state)	Training Workshops Ongoing technical assistance Provision of materials	Diffusion of innovation theory (Roger, 2003); Social learning theory (Parcel et al., 1989)	<ul style="list-style-type: none"> - Three-fourth of who received the Nutrition For Life program materials used them in teaching - Home and career skills classes using the program material produced significantly higher nutrition attitude and behavior scores than classes in which nutrition was taught without the program material; no differences were found in health classes 	NR
Patterson et al., 1998	Worksite health promotion program	Worksite (16 states, U.S.)	Provision of intervention protocols and materials	NR	NR	NR
Harvey-Berino et al., 1998	Nutrition education guide	Teachers/ school (Vermont)	Mass mailing of program flyer Training Provision of program materials Linkages with grocers	Diffusion of Innovation theory	<ul style="list-style-type: none"> - Forty two percent of those returning the respondent survey reported using the nutrition guide - Teachers in schools that received training support were significantly more likely to use the guide and have other teachers use the guide - Schools that were linked to a grocery store (and also had teacher training) were significantly more likely to use the guide and have other teachers use the guide 	NR

Table 2.1. (continued)

Hoelscher et al., 2001 McCullum-Gomez et al., 2006	Health promotion intervention	School (Texas)	Training Provision of low-cost program materials Developing school support	Diffusion of Innovation theory; Social cognitive theory (Bandura, 1986); Social marketing (Siegel & Doner, 1998)	On average ~80% of CATCH Eat Smart Guidelines were being implemented	NR
Heath & Coleman, 2003 Coleman et al., 2005	Health promotion intervention	School (El Paso, Texas and New Mexico)	Forming action committee Training Booster training Financial support Provision of program materials Technical assistance Allowing flexibility or adaptation	NA	<ul style="list-style-type: none"> - By fall 2002, a total of 108 elementary schools were implementing all components of EL Paso CATCH program - The El Paso CATCH intervention successfully slowed (by 9.5% point on average) the epidemic increase in risk of overweight seen in control school children during a 3-year follow-up study 	NR
Wiecha et al., 2004; Bauer et al., 2006	Health education curriculum	Teachers/ school (Boston, MA)	Creating a project advisory board Workshop Ongoing technical assistance Linking agent (program coordinator)	Diffusion of innovation theory	<ul style="list-style-type: none"> - Teachers delivered dose levels (mean) consistent with program intent during the 2nd and 3rd years - Students were exposed to over 70% of all lessons at 5 of 6 schools, 47% at the 6th school over the 3-year study period 	Since the pilot year, no schools have ceased implementation (at the time of publication); The public school system ultimately obtained federal grant funds to sustain and expand the program

Table 2.1. (continued)

Nanney et al., 2007	Dietary curriculum	Parent educators/ Parents as Teachers (PAT) training centers (nationwide)	Media and personal communication channels	Diffusion of innovation theory	NR	NR
Naylor et al., 2010	Health promotion program	School (in aboriginal communities, British Columbia)	Establishing a partnership between academic universities and aboriginal communities; Training Refresher training Technical assistance Provision of materials	NR	<ul style="list-style-type: none"> - Activities were adapted by local teachers to enhance the relevance for the Aboriginal community - Adherence to weekly logging was low (34%) - Schools delivered well over the goal of one activity per week of healthy eating activities; but implementation of the activities and evaluation procedures varied substantially across schools and teachers 	NR

NR, not reported. Source: Rabin et al., 2010

CHAPTER 3. METHODS

This dissertation describes the process and key factors of community implementation of a food store-based nutrition intervention on the Navajo Nation through an academic-community partnership. In this chapter, I describe the study design and setting, data collection procedures and data analysis methods.

3.1 STUDY OVERVIEW

The Navajo Healthy Stores (NHS) program was designed to improve dietary patterns on the Navajo Nation and to reduce risk for obesity by improving the availability of healthy foods in local stores and promoting the purchase, preparation and consumption of healthy food alternatives in local stores (Gittelsohn, Kim, He, & Pardilla, 2013). The program was developed through extensive formative research and a community engagement process, based on a previous intervention trial (Curran et al., 2005; Vastine et al., 2005). The overall intervention approach was a locally implemented and sustained intervention through a collaboration with Navajo Special Diabetes Project (NSDP), a community-based health organization funded under the Special Diabetes Program for Indians (SDPI) Community-directed Grant Program.

This dissertation was a substudy within the larger NHS intervention study which aimed to understand how such academic – community partnerships can enhance (or potentially detract from) the community implementation and sustainability of nutrition interventions. The aims of this substudy were to access the partnership process involved in the design, implementation, evaluation and continuance of the NHS program and to

identify key factors affecting the partnership process. I explored three key aspects, each guided by specific research questions:

1. To examine the academic-community implementation partnership process:
 - 1.1 How was the implementation partnership formed and how did it evolve?
 - 1.2 What were strategies used by the partnership to implement and sustain the program?
 - 1.3 What were key challenges for the implementation partnership?
2. To identify key factors affecting the academic-community partnership effort:
 - 2.1 How and what factors have facilitated the partnership effort to implement and sustain the program?
 - 2.2 How and what factors have hindered the partnership effort to implement and sustain the program?
3. To understand challenges in community implementation of the program from the perspectives of local health staff and food store owners:
 - 3.1 What challenges were faced by local health staff in recruiting food stores and working with store owners?
 - 3.2 What challenges were faced by store owners in participating in the program?
 - 3.3 What were store owners' perceptions about the program and its implementation by local health staff?

3.2 STUDY DESIGN AND SETTING

This study used a qualitative approach, which offers a means of investigating a process in a naturalistic setting and access to experiences and perceptions of others (Merriam, 1992; Morse & Field, 1995; Patton, 2001; Weiss, 1994), therefore, was well suited for this study. A combination of fieldwork, semi-structured interviews and document review was used to understand the partnership process and key factors from the perspectives of academic partners, local health staff, and store owners of participating stores on the Navajo Nation.

The Navajo Nation is the largest federally recognized American Indian (AI) tribe in the United States, spanning 27,000 square miles across New Mexico, Arizona, and Utah (Figure 3.1), with an estimated on reservation population of over 250,000 individuals (NDOH, 2004). The Nation is divided into 5 agencies (similar to counties) that consist of 110 chapters (similar to towns, the smallest administrative units on the Navajo Nation). Most of the Navajo Nation is remote and rural, and much of the population lives on isolated homesteads of several related households (Pareo-Tubbeh et al., 2000). Geographic remoteness, lack of infrastructure (e.g., electricity, paved roads, telecommunication, and transportation), and limited cash resources have been major obstacles for Navajo economic development, access to the delivery of health care (NDOH, 2004). Poverty and unemployment rates are high, at 42.9% and 54.1% respectively (NDED, 2006). Food insecurity rates on the Navajo Nation are the highest reported to date in the USA and are likely attributable to the extremely high rates of poverty and unemployment (Pardilla, Prasad, Suratkar, & Gittelsohn, 2012).

The lack of retail outlets is one of the major economic problems on the Navajo Nation, resulting in leakage of Navajo dollars (NDOH, 2004). According to a reservation-wide food source survey conducted as part of the formative research of the NHS program in 2007, there are only 9 supermarkets on the reservation in the small towns where a shopping center is located. Most retail food stores are small grocery stores or convenience gas station stores that are scattered about the rural areas of the Navajo Nation. There are also several trading posts and a few flea market that sell limited food items. Across the reservation, there are many food vendors that sell a variety of prepared foods, such as fry bread, blue corn bread, piki bread, tamales, Navajo tortillas, corn meal, Indian tacos, hamburgers, *piñon* nuts, and soft drinks, among others. Thus, the NHS program planned to utilize the available environmental resources by conducting interventions in grocery stores, trading post, and convenience stores (Gittelsohn et al., 2013). Among participating stores in this study, 4 stores were Bashas' stores (an Arizona-based, family owned grocery chain), one was a City Market store, and 8 convenience stores or gas stations, and 2 were trading post. These stores scattered across 5 Navajo agencies (Table 3.1).

Navajo Special Diabetes Project (NSDP) is one of the 14 tribal health programs provided by the Navajo Division of Health (<http://www.nndoh.org>). NSDP was created in 1999 and funded under the Special Diabetes Program for Indians (SDPI) Community-directed Grant Program “to promote healthy lifestyle and develop strategies to reduce and prevent diabetes affecting the Navajo people” (www.nnsdp.org). NSDP provides primary, secondary, and tertiary prevention services to a wide range of target population,

including school-aged children, adult at risk of diabetes, newly diagnosed diabetic patients, pregnant women and elderly. Primary activities include preventive education, raising awareness of diabetes, community screenings for early detection and referrals for more extensive testing and treatment, promoting the importance of physical activities and proper nutrition, diet and foods to combat diabetes (NSDP interim report, 2009). Serving a large, scattered population in a remote, rural reservation poses a unique challenge for the NSDP in preventing and treating diabetes with limited funding (less than 10% of the total budgets go to support program activities).

NSDP has established a reservation-wide program, consisting of eight service areas located throughout the Navajo Nation with the central administration located in the Capital - Window Rock, Arizona. A program manager provides oversight and direction to the program, and eight program supervisors provide guidance and support to the respective service area office. There were 99 FTE positions, such as senior community health workers (17), health education technicians (15), fitness specialists (7), nutritionists (6), and nutrition education technicians (2), among others. A majority of the NSDP staff members are bilingual (Navajo/English). Because the NSDP is responsible for diabetes prevention and community nutrition, the NHS academic team identified NSDP as a logical partner to work with on the program. Participants in this study were NSDP nutritionists and community health workers (as interventionists) and their supervisors/program managers.

3.3 DATA COLLECTION METHODS

This study used a combination of fieldwork, semi-structured interviews and program documents as primary sources of data.

3.3.1 Fieldwork

This study incorporated multiple stages of fieldwork between January 2007 and May 2009. The first was during the development and initiation of the NHS program, when I visited the Navajo Nation multiple times (usually about one week per visit) to assist in Food Frequency Questionnaire (FFQ) development, trainings of baseline data collectors, and NHS community workshops. During these visits, I attended meetings with NSDP representatives, and talked to some of NSDP managers and staff to understand their work and community they serve. I took notes during the meetings with NSDP representatives and community workshops, and wrote up meetings minutes and workshops reports. The second stage of fieldwork occurred during implementation of the early phases of the NHS intervention, when I attended two interventionist trainings, a capacity building workshop, meetings with NSDP leaderships, as well as Navajo Nation Human Research Review Board (NNHRRB) meetings. During this fieldwork, I closely observed interactions between the NHS academic team and NSDP managers, supervisors and interventionists and reactions of the NSDP managers, supervisors, and interventionists to the trainings, capacity building workshop, as well as the NHS implementation. I also paid close attention to emerging issues that could affect the NHS partnership and intervention implementation.

Through these experiences, I gained insight into how the NHS partnership process unfolded and what were key issues that could affect the partnership effort to implement and sustain the NHS program. Moreover, these experiences provided me opportunities to know as well as to be known by the NSDP people who were closely involved in the program. As a result, I decided to conduct semi-structured interviews with the NSDP managers and interventionists as well as with the key members of the NHS academic team during the last stage of fieldwork in the end of the NHS implementation.

3.3.2 Semi-Structured Interviews

Semi-structured interviews were conducted to understand the experiences and perceptions of individuals as part of the NHS program. Based on the initial fieldwork experience, I identified the principal investigator (PI), the field coordinator, NSDP interventionists, field supervisors and program managers as potential study participants. Then I contacted NSDP interventionists to help identify potential informants from the participating food stores. Approximately 55 people were possible to be interviewed. Although at least two people in each store were involved in the NHS implementation, NSDP interventionists identified the store owner or store manager of each store as key store people involved during the implementation. A total of 39 individuals were identified to be interviewed for this study.

To conduct the interviews, first I sent out a letter to the NSDP top manager (director), in which I explained the purpose of interviews, who are going to be interviewed, what types of questions are to ask, and how interviews would be conducted. The letter also explained IRB approvals for conducting the interviews, obtaining

informed consent from each individual, honoring any individual's refusal to be interviewed, and confidentiality of information provided through the interviews. The director was asked to distribute the letter to program managers, field supervisors, and interventionists. As for individuals who have left NSDP to work elsewhere, their contact information was obtained from their former co-workers and they were contacted by phone. The store owners/managers were contacted by phone after I arrived at the research site, explained to them about the purpose of this study and asked if they were interested in participating in an interview.

All but one individual identified for this study agreed to be interviewed. All signed the consent form before the interview and kept a copy of the signed consent form (Appendix A). The manager of a chain convenience store owned by a private company was not given permission to participate in the interview by their top manager. Thus, a total of 38 individuals were interviewed (Table 3.2).

A semi-structured interview guide was used during interviews. The interview guide was modified for different key stakeholders according to their main role in the program. This allowed the researcher to make best use of the limited time available to participants for the interview, exploring in detail important issues that are particularly relevant to their experiences. For example, the interview guide for interventionists specifically included questions in terms of how the intervention activities were carried out in the field (Appendix B). For store owners/managers, interview topics included: store recruitment, intervention implementation, barriers to implementation, coordination with interventionists, and program impact on stores and store customers.

Interviews were conducted by the researcher in a private office at their workplaces during weekdays. Signed consent was obtained from all participants. There was no audio-recording of interviews with local stakeholders because of participants' preferences to remain completely anonymous, and because of time constraints to obtain the Navajo Nation Human Research Review Board (NNHRRB) approval for audio-recording at the time this study was conducted. I wrote down interview responses with permission, and made every effort to capture actual words or sentences used by participants. On the same day of the completion of an interview, interview responses were entered into Microsoft Word by the researcher, along with a description of the interview setting and informal conversation with the participant before and after the interview, as well as my reflection about the interview. The duration of interviews ranged from 30 minutes to 2 hours, but most of the interviews lasted about 1 hour. Two follow-up interviews were conducted with two NSDP managers who were more knowledgeable and reflective of the organizational decision making process to obtain answers to additional questions that were emerged from previous interviews.

3.3.3 Document Review

Program documents can provide “a behind-the-scenes look at program processes” (Patton, 2001, p294) and help “ground an investigation in the context of the problem being investigated” (Merriam, 1992, p126). In this study, available documents were reviewed to reveal the complexity of partnership development and program implementation process, to understand the experiences and perceptions of study

participants in the program context, to corroborate information from interviews, as well as to provide background detail for the study.

The primary documents reviewed for this study were relevant to the development and implementation of the NHS program. These documents included program meeting and conference call minutes, formative research reports, community workshop reports, the interventionist manual of procedures, presentation slides for training and capacity building workshops, progress updates and reports, and journal articles. A second set documents, pertaining to the development, implementation and evaluation of the AHS program, was reviewed to explore the adaptation of the previous intervention to the Navajo setting. These documents included formative research reports, community workshop reports, interventionist manual of procedures, journal articles and other publications. Documents were collected throughout the study period (Appendix C). The PI provided all official or unofficial documents generated for the NHS and AHS program. Additionally, relevant documents were also obtained from the NSDP.

3.4 DATA MANAGEMENT AND ENTRY

A data documentation form was created to record all the data collected for this study by category, and all documents were properly sorted and labeled (with an identifying notation) for easy access. Electronic versions of the data were stored in a password protected computer and hard copies were stored in a locked cabinet and access was limited to the researchers. NVivo (version 8), a computer-assisted qualitative data analysis software (CAQDAS), was used to assist data analysis.

3.5 DATA ANALYSIS

The template approach (Crabtree & Miller, 1999; King, 1998) was used to analyze textual data (from interviews and documents). In template analysis, a list of pre-determined codes or conceptual framework (the initial template) is applied in order to analyze textual data and modified through ongoing analysis until the researcher has achieved as full an understanding of the data as feasible (King, Carroll, Newton, & Dornan, 2002). Such a well-structured analytical process produces a coding template representing themes identified in the data and helps produce a clear, organized final account of a study (King, 2004). Template analysis was appropriate for this study for the following three reasons. (1) It allowed me to use *a priori* codes to help guide analysis. Given my fieldwork with the NHS program and review of literature on dissemination and implementation, applying *a priori* a number of codes helped me to focus on areas of greatest relevance to the research questions. (2) Template analysis works particularly well in studies which seek to examine the perspectives of different groups within a specific context. This study sought to understand the implementation of the NHS program from the perspectives of researchers, practitioners, and food store owners. (3) A key feature of template analysis is hierarchical coding, using broad themes encompassing successive narrower, more specific themes which enable fine distinctions to be made. In this study, hierarchical coding allowed me to analyze the data at varying levels of specificity and to present important aspects of partnership and implementation process in detail.

The analytical process for this study was provided in Figure 3.2. With guidance from the fieldwork, literature review, and interview guides, I constructed a coding template through careful reading and rereading of textual data from the documents and interviews. These preliminary codes were revised multiple times working back and forth between the data and the coding template. In this process, new codes were added and some initial codes were redefined, merged with other codes, placed under different categories, or deleted by examining the meaningfulness of the themes in the light of the research questions and the accuracy of the placement of data in categories. For example, a level-two code ‘interaction with customers’ under a level-one code ‘intervention implementation’ was divided into two separate codes: ‘use of intervention materials’ (a level-two code) and ‘customer response/interest’ (a level-three code under a level-two code ‘interactive educational sessions’).

Then, I and a research assistant who had a qualitative data analysis background independently coded four sets of interview responses. The researcher and a research assistant compared coding, discussed discrepancies, and made several changes to the coding template. Again, the researcher and the research assistant coded another four interview notes independently, which resulted in further refinements to the coding template. Minor adjustments were made to the template on the basis of a detailed rereading of the textual data from the documents and interviews to produce the final version of the analytical template (Appendix D). Coded segments of text were entered into the appropriate data charts created for each code in the final version of the coding template using NVIVO 8.

I prioritized themes that were of direct relevance to the main research questions of this study and of great importance to participants by reviewing the data charts. Representative, contextually rich quotes were identified to aid the understanding of specific points of interpretation. Because interview responses were hand-written, quotes were grammatically corrected where necessary. The findings were integrated with existing empirical and conceptual literature, and the PI as well as the field coordinator reviewed all drafts of papers. Based on their comments, revisions were made to produce final papers.

3.6 ETHICAL APPROVAL

All study protocol described here was approved by both the Johns Hopkins University Institutional Review Board (IRB) and the Navajo Nation Human Research Review Board (NNHRRB).

3.7 FUNDING

Funding for this study came from the Center for Livable Future, Johns Hopkins University and the US Department of Agriculture Grant Number 2010-8515-20666.

Table 3.1. Type and number of NHS participating stores by intervention store area

Intervention store area	Participating store type (# of stores)
(Navajo agency)	
Crownpoint area (Eastern agency)	<ul style="list-style-type: none">• Supermarket (1)• Convenience store (2)• Trading post (1)
Shiprock area (Shiprock agency)	<ul style="list-style-type: none">• Supermarket (1)• Convenience store (1)• Trading post (1)
Pinon area (Chinle agency)	<ul style="list-style-type: none">• Supermarket (1)• Convenience store (2)
Dilkon area (Ft. Defiance agency)	<ul style="list-style-type: none">• Supermarket (1)• Convenience store (1)
Tuba city area (Western agency)	<ul style="list-style-type: none">• Supermarket (1)• Convenience store (1)

Table 3.2. Study participants by affiliation (# of participants)

Johns Hopkins University	Navajo Special Diabetes Project	Food stores
<ul style="list-style-type: none"> • Principal investigator (1) • Field coordinator (1) 	<ul style="list-style-type: none"> • Managers (5) • Field supervisors (8) • Intervention staff (10) 	Owners/managers (13)

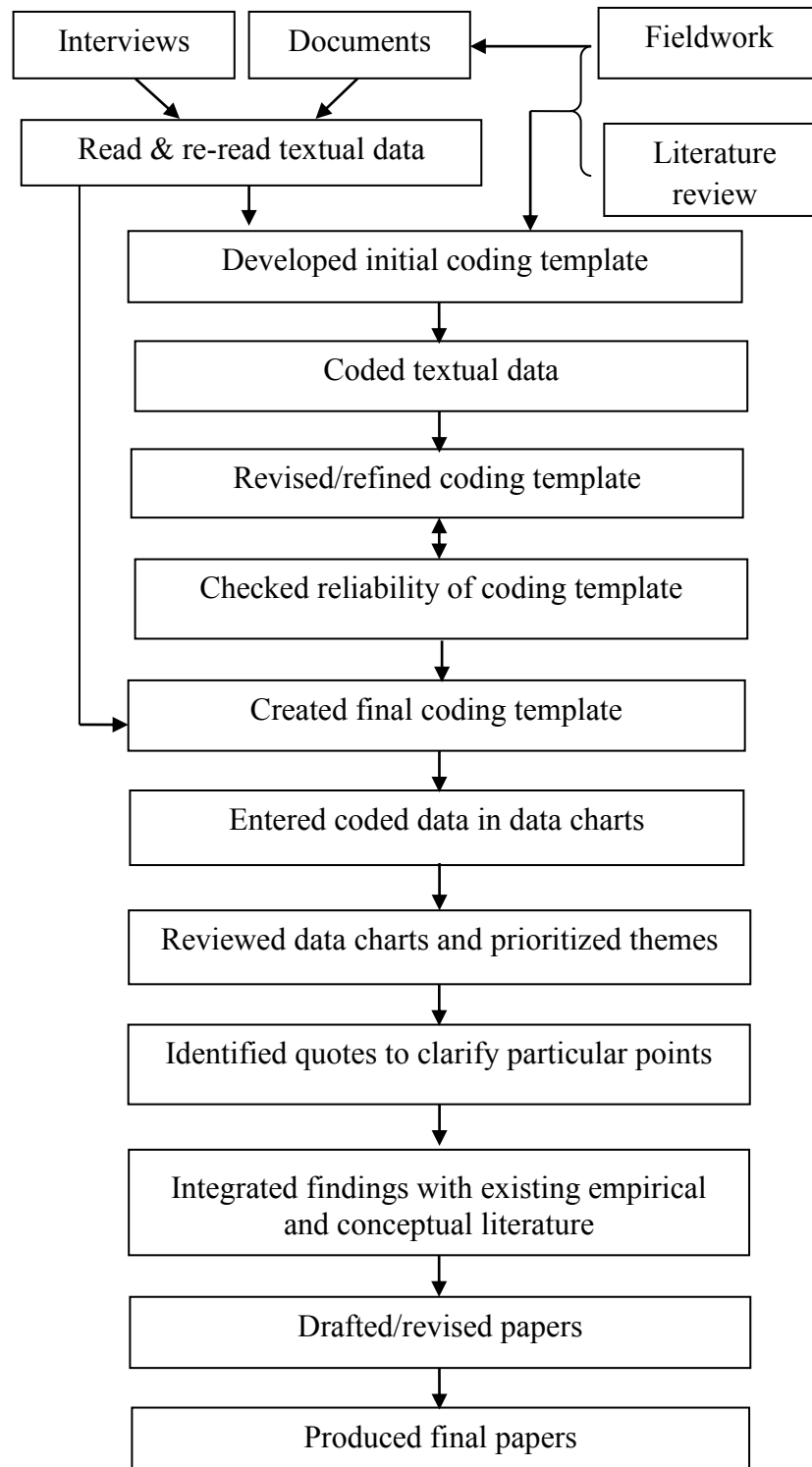
Figure 3.1. Study setting: Navajo Nation map



Source:

<http://www.statemuseum.arizona.edu/exhibits/navajoweave/contemp/map.html>

Figure 3.2. Flow diagram of qualitative data analysis



CHAPTER 4: IMPLEMENTATION PARTNERSHIP PROCESS FOR A STORE-BASED NUTRITION INTERVENTION ON THE NAVAJO NATION (PAPER 1)

Target journal: American Journal of Preventive Medicine

4.1 ABSTRACT

Academic - community partnerships offer a model for effective implementation of evidence-based interventions in community settings by incorporating local partners' knowledge of the host setting, with researchers' knowledge of effective support strategies and of the intervention to be implemented. However, little is known about how the participatory partnership for implementation develops and how it affects the process of evidence-based intervention implementation. The Navajo Healthy Stores (NHS) program was a locally implemented food store-based intervention developed through extensive formative research and a community engagement process, based on a previous intervention trial. The purpose of this study was to identify the process and strategies used by the academic - community partnership to implement the NHS program. A qualitative study was conducted using a combination of face-to-face interviews with 24 key stakeholders and a review of program documents. Results indicate that the academic-community partnership evolved naturally through an engagement, formalization, mobilization, and maintenance process. The academic-community partnership had faced some important challenges needed to address in order to successfully move through the stages of implementation. Understanding the process and key challenges of

implementation can guide academic – community partnerships in translating evidence-based interventions into sustainable, community implemented programs.

4.2 INTRODUCTION

Store-based intervention trials to improve dietary quality and reduce risk for obesity in underserved communities (i.e., low income, ethnic minority, inner-city and rural communities) have shown some success in increasing the availability and sale of healthy foods, the purchase and consumption of those foods, and consumer knowledge (Escarton et al., 2013; Gittelsohn et al., 2012a; Glanz & Yaroch, 2004). Often these trials have applied multipronged strategies (food provision, infrastructure change, and health communication) along with community engagement to increase both supply and demand for healthy foods. It is expected that implementing and sustaining effective store-based environmental interventions at the local level can produce impact at the population level in obesity and chronic disease over the long term (CDC, 2009).

Research on translating nutrition intervention trials to locally implemented community interventions is scarce (Ciliska et al., 2005; Rabin et al., 2009). Participatory partnership approaches that value local perspectives, stakeholder input, and community resources are essential for successfully implementing evidence-based interventions in relevant settings and populations (Cargo & Mercer, 2008; Glasgow et al., 2012).

Wallerstein and Duran (2010) demonstrate the potential of community participatory research approaches for addressing core challenges in the translation of intervention trials to real-world community programs. However, little is known about how the participatory

partnership for implementation develops and how it affects the process of evidence-based intervention implementation.

4.2.1 Navajo Healthy Stores Program

The Navajo Healthy Stores (NHS) program was a food store-based intervention designed to improve dietary patterns on the Navajo Nation and to reduce risk for obesity by increasing the availability, purchase, and consumption of healthy foods, based on the findings from a previous intervention trial (Curran et al., 2005; Vastine et al., 2005). An academic team from the Johns Hopkins University School of Public Health (JHSPH) partnered with the Navajo Special Diabetes Project (NSDP), a community health organization funded under the Special Diabetes Program for Indians (SDPI) (Community-directed) Grant Program for diabetes prevention and treatment services. The NHS program had four overlapping phases: planning and formative research, intervention development, implementation, outcome evaluation. An approximately 20-month long planning and formative research phase included obtaining approvals from the Navajo Nation Human Research Review Board (NNHRRB) and Navajo agencies and generating local planning data. The formative research focused on identifying food sources and availability of healthy foods, commonly consumed foods and food shopping habits on the Navajo Nation, programs or activities related to healthy eating in stores and in the community (Sharma et al., 2009).

The NHS program was developed with the aid of 13 1-2 day long community workshops in the formative planning stage. The workshop discussions generated a series of key foods and behaviors for promotion, using a brainstorming and prioritizing process

(Gittelsohn et al., 2010a). A series of messages and ideas were developed to promote healthy food choices, preparation, and consumption. The NHS program consisted of a six-phase intervention, each phase lasting 6-10 weeks focused on different foods and behaviors for promotion, with interactive sessions at local retail food stores through cooking demonstrations and taste testing of healthier food alternatives for community members. The NHS intervention was planned to implement in two rounds (round-one implementation and round-2 implementation) for the purpose of evaluation. Ten large store areas on the Navajo Nation were identified and randomized into intervention areas and control/delayed intervention areas. For round-one implementation, 15 stores in the intervention areas were targeted, including Basha's Stores, a City Market in Shiprock, and various smaller stores within 30 miles of larger stores. For round-two implementation, the intervention would expand to stores in five control areas.

The overall NHS intervention approach was a locally implemented and sustained intervention. The intervention was carried out by NSDP nutritionists/health workers. The NHS academic team provided periodic additional trainings and oversight. The interventionists were assigned 1-2 stores for their work on the project and conducted a 1-2 hour interactive session at each store 2-4 times per month. The interactive sessions included demonstrating healthier cooking methods, taste testing healthy foods, giving away promotional items, and responding to questions from store customers. The interventionists' additional duties were to create and maintain relationships with food stores, work with stores to stock key promoted healthier foods, and set up media

materials such as educational displays, posters, and shelf labels. Radio announcements of key messages were recorded and played regularly in both Navajo and English.

The NHS program was evaluated with a pre-post prospective longitudinal cohort study of a randomly selected sample of consumers divided into intervention and comparison groups, with measurements at baseline prior to the beginning of the round-one implementation and 15-20 months later after the round-one implementation. Intervention impact was examined by analyzing pre-post differences by intervention group and by intervention exposure level. When intervention and comparison groups were compared, only Body Mass Index (BMI) showed a trend towards impact of the intervention. However, greater exposure to the intervention was associated with significantly reduced BMI, and improved healthy food intentions, healthy cooking methods, and healthy food getting (Gittelsohn et al., 2013). To our knowledge, this is one of the first such community-based trials to show impact on weight status among adult AI.

The purpose of this study was to identify the process and strategies used by the academic - community partnership to implement the NHS program. Specifically we conducted a qualitative study guided by a conceptual framework to address the following research questions: (1) How was the implementation partnership formed and how did it evolve? (2) What were strategies used by the partnership to implement and sustain the program? (3) What were key challenges for the implementation partnership?

4.3 METHODS

4.3.1 Conceptual Framework

Figure 4.1 depicts the conceptual framework developed for this study. Academic – community partnership approaches, in particular community-based participatory research (CBPR) approach can play an important role in successful implementation of evidence-based interventions by incorporating local partners’ real-world knowledge and experiences with researchers’ expertise in evidence-based interventions and effective support strategies (Cargo & Mercer, 2008; Glasgow et al., 2012; Lindamer et al., 2009; Wallerstein & Duran, 2010). According to Cargo and Mercer (2008), participatory research approaches have seven core elements: mutual respect, trust, capacity building, empowerment, ownership, accountability, and sustainability, which undergird partnership efforts for the development and implementation of an evidence-based intervention. Implementation is a process, by which an evidence-based intervention is put to use or integrated within a setting (Rabin et al., 2010). The process of implementation can be categorized into four stages: exploration and adoption, program installation, implementation, and sustainability (Fixsen et al., 2005). The purpose of exploration is to assess the match between the evidence-based intervention and the needs of the potential host community/organization and to make a decision to adopt (or not). After a decision is made to implement the intervention, an organizational change process begins to put in place structural supports necessary to initiate the intervention (program installation). During the initial stage of implementation, the focus is on increasing staff skill and organizational capacity and on fostering supportive organizational culture. Full

implementation occurs when the intervention is fully operational and becomes an “accepted practice” within the setting. Sustainability of an implementation site begins during the exploration stage and continues thereafter for the long-term survival and continued effectiveness of the intervention.

Corresponding to these four stages of implementation, participatory partnerships for implementation of an evidence-based intervention develop and evolve in four consecutive stages: engagement, formalization, mobilization, and maintenance (Cargo & Mercer, 2008). The engagement stage facilitates identification and understanding of a potential host community/organization and development of relationships and trust. Formalization occurs when a formal agreement is established with the host organization, outlining the role, responsibilities, and expectations for the partnership. Mobilization involves preparing the organization, supporting systems, and staff for implementation of the intervention. Maintenance is needed to ensure sustainability of the partnership, capacity building, and the intervention. This conceptual framework hypothesizes that an effective (or ineffective) participatory partnership process can facilitate (or hinder) the host organization successfully moving through the stages of implementation. This conceptual framework also acknowledges that multi-level factors affect the implementation process (Greenhalgh, Robert, Macfarlane, Bate, & Kyriakidou, 2005; Durlak & DuPre, 2008). Guided by this conceptual framework, this study aimed to understand how the participatory partnership for the NHS program developed and what key challenges were for the partnership moving through the stages of implementation.

Because the main study, in which this substudy was nested, was guided by Shediac-Rizkallah & Bone's (1998) three dimensions of sustainability, this substudy also qualitatively explored the extent to which the three dimensions of sustainability were achieved as a result of the academic-community implementation partnership. Shediac-Rizkallah & Bone (1998) theorized that program sustainability has three dimensions: (1) maintenance of health benefits of the program (program effectiveness), (2) continuing of program benefits through an organizational structure (institutionalization), and (3) building capacity of the recipient community (capacity-building) (Shediac-Rizkallah & Bone, 1998). Maintenance of health benefits is at the heart of sustainability for health promotion programs. Often health promotion programs do not immediately produce measurable health outcomes. Behavioral changes must be sustained over a long period of time before any significant decrease in actual morbidity or mortality can occur and be measured (Puska et al., 1985). Institutionalization refers to long-term survival of a program within an organizational structure (Steckler & Goodman, 1989). When institutionalization occurs the program becomes part of the organization's routine operations and loses its separate identity (Goodman, McLeroy, Steckler, & Hoyle, 1993; Yin, 1981). Capacity-building refers to sustainability in communities. It represents a process of strengthening the problem-solving capability of communities not only to address the current health problems but to tackle new or other health issues (Green, 1989; Hawe, Noort, King, & Jordens, 1997; Shediac-Rizkallah & Bone, 1998).

4.3.2 Study Design and Data Collection

This study used a qualitative approach using a combination of semi-structured interviews and program documents as primary sources of data. This study was approved by both the Johns Hopkins University Institutional Review Board (IRB) and the Navajo Nation Human Research Review Board (NNHRRB).

Semi-structured interviews

Semi-structured interviews were conducted to understand the experiences of individuals as part of the NSDP and NHS academic team. A total of 24 individuals, who had been closely involved in the partnership development and implementation of the NHS program were identified based on the researcher's fieldwork experience with the NHS program. These individuals included the NHS principal investigator, field research coordinator, NSDP managers, supervisors, and interventionists. Interviews were conducted by the researcher at participants' workplaces. An interview guide was used during interviews. Topics covered included: project initiation, intervention adaptation, implementation, sustainability, program facilitators, barriers, and impacts. There was no audio-recording of interviews with local stakeholders because of participants' preferences to remain completely anonymous, and because of time constraints to obtain the NNHRRB approval for audio-recording at the time this study was conducted. The researcher wrote down interview responses with permission, and made every effort to capture actual phrases and sentences used by participants. Signed consent was obtained from all participants. The duration of interviews ranged from 30 minutes to 2 hours, but most of the interviews lasted about 1 hour.

Documents review

Program documents were reviewed to reveal the complexity of partnership and implementation process and to understand the experiences and perceptions of study participants in the program context. These documents included program meeting and conference call minutes, formative research reports, community workshop reports, the interventionist manual of procedures, presentation slides for training and capacity building workshops, progress updates and reports, and journal articles. Documents pertained to the development, implementation and evaluation of the previous food store-based intervention trial was also reviewed to explore the degree of intervention adaption to the Navajo setting. Additionally, available documents of the NSDP were also reviewed for relevant information.

4.3.3 Data Analysis

Textual data were analyzed thematically, using the template approach (Crabtree & Miller, 1999; King, 2004). With guidance from the fieldwork, literature review, and interview guides, the researcher constructed a coding template through careful reading and rereading of textual data from the documents and interviews. These preliminary codes were revised multiple times working back and forth between the data and the coding template. Then, the researcher and a research assistant independently coded four sets of interview responses, and compared coding, discussed discrepancies. Several changes were made to the coding template. Again, the researcher and the research assistant coded another four interview notes independently, which resulted in further refinements to the coding template. Minor adjustments were made to the template on the

basis of a detailed rereading of the textual data from the documents and interviews to produce the final version of the analytical template. Coded segments of text were entered into the appropriate data charts using NVIVO 8. The researcher prioritized themes that were of direct relevance to the main research questions of this study and of great importance to participants by reviewing the data charts. Representative, contextually rich quotes were identified to aid the understanding of specific points of interpretation.

4.4 RESULTS

The implementation partnership for the NHS program naturally went through the four partnership stages: engagement, formalization, mobilization, and maintenance. Relevant components, activities, key challenges, and outcomes of NHS implementation partnership process are presented in Table 4.1 and discussed below.

4.4.1 Partnership Stages

(1) The engagement stage: formative research, community workshops, relationship building

A key approach to engage community stakeholders and gain support for the NHS program was conducting formative research on the local food environment and eating behaviors, which demonstrated a need for food store-based interventions. The formative research engaged community members, health staff, and store managers, who provided important information on promoting healthy eating in the community to guide the development of the NHS intervention. Community workshops were another key approach used to engage various community stakeholders during the development of the NHS

intervention approach based on the findings from the Apache Healthy Stores (AHS) intervention trial and to facilitate community ownership and the sustainability of the program. A total of 13 community workshops were held across the Navajo Nation. These workshops brought together a diverse group of people, including representatives from local health and human service organizations and local stores, as well as community members. On average approximately 20 people attended each workshop, ranging from 4 to 27 participants.

Importantly, the formative research and community workshops facilitated building trust and relationships with potential community partners and the identification of NSDP as a host organization for the program. During the formative research, the NHS field coordinator, who had prior working experiences with NSDP on other research projects and already familiar with NSDP managers and staff, introduced the program to NSDP through the senior nutritionist that oversaw NSDP nutrition activities. The timing was fortuitous, as at the time NSDP already had a plan to work with grocery stores on healthy foods and had started working with a few supermarkets on nutrition education and cooking demonstrations. The NHS program presented an opportunity for enhancing nutrition services for the community and would help to achieve established program goals. As a member of the NHS academic team described,

“When I spoke to the (Navajo Special Diabetes) Program early on, they said what you’re doing with the healthy store intervention is one piece of what we should be doing. So they felt it should be naturally part of their program activities.”

(Academic partner, R1)

NSDP leaderships showed great enthusiasm for the NHS program and contributed to arranging 3 community workshops, disseminating the program to the community and local partners, and recruiting community members, community leaders, local store managers and health staff for the community workshops. NSDP staff, esp., nutritionists attended these workshops and contributed to the development and refinement of the intervention approach and materials. Initial meetings between the NHS academic team and the NSDP leaderships focused on understanding needs of each other and how collaboration could potentially address these needs. The academic team emphasized implementing a self-sustained healthy stores program on the Navajo Nation and transferring the ownership of the NHS program to the local community. From the academic team's perspective, the key to the sustainability of the NHS program was to train local staff and incorporate the NHS intervention activities within existing health promotion programs. NSDP wanted to enhance nutrition education activities through developing evidence-based projects. As a NSDP manager (M5) stated, "*The whole country has moved to evidence-based projects and this is one way to develop it*". Therefore, it appeared a good match between the needs of the NHS program and NSDP.

However, both the formative research and community workshops were unable to engage and obtain support from some important stakeholders, such as local leaders (e.g., chapter council members), organizational decision makers (i.e., of health and human service organizations), small store managers, local fresh food producers, representatives from the division of community development, and local media representatives (newspapers and radio stations) that would have played important roles in the

implementation and sustainability of the NHS program. A NSDP supervisor, whose nutritionist left for a new position in the early stage of the NHS intervention implementation remarked,

“It was felt that we didn’t get any coordination from the top. It would have been nice to get (I.H.S.) community health nutritionists’ help. ... Their boss didn’t allow his staff to help with the teaching, although they did have a community nutritionist. She showed up at the Window Rock trainings, but was not able to show up at our field sites to teach us.” (NSDP manager, M10)

Initially, it was intended to create a Community Advisory Committee (CAC) to guide the implementation process and sustainability of the NHS program. A number of people interested in being part of the CAC signed up during the community workshops. However, the original CAC plan was scrapped and the NHS academic team focused on working with NSDP. As a member of the NHS academic team explained,

“We probably focused on the Special Diabetes Program pretty quickly. ... The story was there was probably dozens of important stakeholders and the question became ‘who can you work with?’ I think it seemed that the Special Diabetes Program had enough going on a ground level. They can actually get stuff done.”

(Academic partner, R1)

(2) The formalization stage: partnership agreement

A partnership agreement was reached between the NHS academic team and the NSDP leaderships to implement and sustain the NHS program. The two partners agreed to share their resources and expertise by NSDP providing interventionists and program

management and the academic team providing materials, giveaways, trainings, technical assistance, and program evaluation. Capacity building was also a key part of the agreement to improve NSDP capacity and support NSDP beyond NHS related activities as needed (see Mobilization for details). A member of the NHS academic team explained,

“Part of the setup was to provide capacity building activities. And I think they (management) were excited about that possibility to have that happened... that something (the program director) and (the senior nutritionist) really emphasized something that they wanted to learn. Because it would help to evaluate their program and so forth.” (Academic partner, R1)

Specific aspects of the implementation were discussed with the NSDP leaderships, including implementation timeline, staff designation, program management, training, capacity building, program monitoring, performance evaluation, data collection, and reporting. To ensure a successful transition of the NHS program ownership, the plan was the academic team would diminish involvement and support for Round-2 implementation. While consensus was reached between the partners on these aspects of the implementation, they were not developed into a document for future reference. This became problematic when there was frequent manager turnover. A NSDP program manager (M6) remarked, *“There’s no written outline that states what’s supposed to happen. The word ‘oversee’ itself didn’t say what had to take place.”*

The decision to implement the NHS program was a top-down decision, but not without some opposition in the NSDP central administration. A NSDP manager (M7) explained,

“The concerns were that we’re pulling our nutritionists from completing their stated goals and objectives with our contract with the Indian Health Service ... that we needed to spend our time on what they felt nutritionists should be doing: nutrition education, health care, and food demos.” (NSDP manager, M7)

“There were a couple of times heated debates”, another NSDP manager (M5) said “after that the program moved forward”. However, the concern about pulling the NSDP nutritionists from completing their regular duties remained during the NHS round-one implementation. A majority of the NSDP field supervisors did not get involved in the early stages of the partnership (i.e., the development and planning of the program), and felt out of the loop for the most part as the NHS program was coordinated through the central administration.

(3) The mobilization stage:

Staff selection and training

To begin the intervention implementation, the NSDP leaderships selected nutritionists and other health staff with experience in delivering nutrition interventions as interventionists. The interventionists were paired to assist each other and to lighten workload for each other. The senior nutritionist was designated to oversee the implementation and to coordinate with the NHS academic team. However, such personnel arrangement for the implementation was found to be at odds with the NSDP organizational structure as the planning and supervision of field activities took place at the service area level. The interventionists were required to work within their designated service area, due to shortage of staff and limited travel mileages. As a result, most of the

interventionists were discouraged by their field supervisors and unable to work in pairs for the most part of the round-one implementation. As an interventionist remarked,

“I was told to do it by myself by my supervisor. We were put in pairs to do the healthy stores intervention, but our supervisors said ‘No. We have our own staff, you utilize your staff’.” (NSDP interventionist, I1)

A two-day comprehensive training was provided for the NSDP interventionists, which focused on skills and information needed to conduct the NHS program. The duties and responsibilities of interventionists were clearly stated in the interventionist manual of procedures and were reviewed during the training. The NSDP interventionists were trained on the goals, objectives, intervention strategies/approaches and implementation standards of the NHS program. The training demonstrated how to implement the NHS intervention activities, including working with participating stores to make healthier alternatives available, conducting interactive educational sessions (cooking demos and taste tests) with customers, putting up print materials (educational displays, posters, shelf labels) in stores, arranging radio announcements with local radio stations, and reporting a store visit log. The training included role playing interactive sessions with the interventionist trainees and drafting scripts for radio announcements. Participants shared their experiences working with local stores and in the community and discussed implementation-related questions and concerns.

While the nutritionists were well-prepared for the implementation at the practitioner level through the training, this was not true at the administrative level. Necessary structural and procedural changes, including job description and reporting

system, were not in place to support for the interventionists. Although these changes would, as a member of the NHS academic team stated “*take more build up before it could be done*”, it appeared to be critical for the NSDP supervisors to “justify” the interventionist work related to the NHS program. Additionally, although NSDP took the responsibility of purchasing food items locally for the intervention activities, NSDP could only set aside a limited amount of funds due to restrictions on the I.H.S funding and a Purchase Order was not in place when the implementation started. Consequently, the interventionists sometimes did not have these items on time and or in sufficient quantity during the round-one implementation.

Implementation support: booster training, regular teleconference, field coordination, process evaluation

Prior to each intervention phase, a refresher training (or booster training) was provided for the interventionists. These trainings were intended to review implementation progress, to discuss issues and address problems encountered in the previous phase, as well as to plan for the upcoming phase. During these trainings, the interventionists shared experiences among each other and the academic team provided guidance to the questions and concerns that the interventionists brought up. NSDP managers as well as supervisors were invited to the trainings to discuss issues needed to address. An interventionist described,

“We always had meetings, got together with (the PI and field coordinator). We invited our supervisors to make sure this was our priority. ... (The meetings were)

really getting us together to discuss problems and work on them.” (NSDP interventionist, I8)

To address nutrition related questions of the NSDP interventionists, a community nutritionist from I.H.S. was invited for the trainings and helped to develop Frequently Asked Questions (FAQ) in the interventionist manual of procedures. Throughout the implementation, the NHS field coordinator also provided necessary support for the interventionists, such as helping recruit small stores, distributing intervention materials and giveaways to the intervention sites and sharing information among the interventionists.

Regular teleconference between the NHS academic team and the NSDP interventionists was a way to monitor and provide feedback on the implementation. Teleconferences were scheduled biweekly during first two phases and monthly thereafter. During these calls, the NSDP interventionists reported progress and problems related to implementation, and the academic team provided feedback and guidance. However, the interventionists irregularly attended these calls due to lack of access to a telephone at their workplace and conflicting schedules. It was felt that these calls were not sufficient for monitoring implementation and providing feedback. As a member (R1) of the NHS academic team described,

“There’re so many people to report back. It was hard enough to get everybody on the calls much less get them to say ‘did you put up your posters yet’, much less get

them to say ‘did you get them to stock low fat milk’. We just couldn’t get to that specific. There was never time to do that.” (Academic partner, R1)

Another method for monitoring implementation was process evaluation. The interventionists administered a store visit log, which was designed to document details of each interactive educational session (cooking demonstrations and taste tests) they conducted in the intervention stores. The store visit log was slightly modified during the implementation to be more user-friendly and to be consistent with the NSDP recording system for internal use. For example, the age groups of program participants were expanded from 3 broad categories to 6 categories corresponding to the age groups on the NSDP report. The process data was compiled by the NHS academic team and presented during the booster trainings. The process data was used to discuss implementation progress and accomplishments, and to improve program implementation.

Capacity building and supervisor buy-in

The NHS capacity building occurred both informally (unplanned) and formally (planned). Informally, bringing NSDP staff and staff from other health agencies (esp. I.H.S) together in the community workshops and interventionist trainings had helped to enhance capacity of the NSDP staff and increased opportunities for communication and collaboration with other agencies. As a NSDP manager stated,

“(The activities of the NHS program) will help our nutrition staff build their capacity for doing presentations, and actually having the background and the systems and the support not only from the nutrition staff but also from staff from

Johns Hopkins and also with the partners from I.H.S, particularly nutrition staff. Since they're truly registered dietitians as opposed to our nutritionists not that they don't know too many things but they don't have a RD status. And they can learn quite a bit from RD staff from I.H.S, in terms of what they have done in their communities and possibly carry on other collaborative work that exists out there.”(NSDP manager, M4)

Formally, five capacity building workshops were provided throughout the NHS intervention implementation. The target audiences for these capacity building workshops were the NSDP program managers and supervisors, although other staff were also invited to and attended the workshops. The topics of the capacity building were chosen by NSDP leaderships. These workshops included program evaluation, data analysis (two parts), research methods and protocol, and grant writing. The NHS academic team worked with NSDP administrators to make sure that these workshops were participatory and practical. For example, during the evaluation workshop attendees discussed the importance of evaluation for their work, and then prioritized the established goals of NSDP to develop an evaluation plan and evaluation instruments. Data from the NSDP monthly reports were also used for demonstrations and practices during the data analysis workshops.

While the purpose of the NHS capacity building was to enhance knowledge and skills of NSDP managers and supervisors in the topics chosen, these trainings also served as a means of increasing communication within NSDP and building support for the NHS implementation. As a member of the NHS academic team explained,

“The interventionists wanted the opportunities to bring their supervisors on board, because they felt lack of support from their supervisors. So how to use these opportunities to come together serve this additional function, although it served like a hidden function, like a hidden agenda to bring their supervisors there to build support, and that was another reason for the capacity building trainings. In some ways it wasn’t the content of the trainings, it was that opportunity to come together with the intervention people and supervisors and directors.” (Academic partner, R1)

These capacity building workshops were logistically as well as strategically arranged following the booster trainings. However, not all of NSDP supervisors attended each capacity building workshop and booster training with their interventionists. Some supervisors remained unsupportive of the work related to the NHS program. An interventionist remarked,

“I guess they gradually kicked in a little bit, although we had trainings together a lot. Some banned, some supported. They did not have a lot of interest in the program.” (NSDP interventionist, I4)

(4) The maintenance stage: feedback, ongoing support, and sustainability

Feedback on the NHS partnership and implementation was sought by interviewing NSDP managers, supervisors, and interventionists in the end of the NHS round-one implementation. Preliminary findings from these interviews as well as from the impact evaluation of the NHS program were shared with the NSDP managers,

supervisors, and interventionists and lessons learned from the round-one implementation were discussed. Ways to sustain the NHS program were also discussed with the NSDP managers, supervisors, and interventionists, including possible future funding opportunities and potential inclusion in the NSDP strategic plan. The research findings and lessons learned were included in a project policy report with recommendations for how to improve the future implementation of the NHS program (<http://healthystores.org>). This seemed to be very important for NSDP program managers and supervisors to support the continuation of the NHS program. As a program manager stated,

“Impacts have been made are expected, knowing the completed projects. How it’s measured with our program, are we effective or just running around talking about diabetes? ... I feel supervisors should learn that. Once they learned that they are more interested in doing the program knowing it really benefits people.” (NSDP manager, M6)

Still, there was no unanimous support for the NHS round-two implementation at the administrative level. Some supervisors remained concerned about the NHS program was taking interventionists away from their established scope of work. As a supervisor remarked,

“I heard a couple of staff saying ‘I don’t know how much the Healthy Stores program takes away from our scope of work’. ... This is my question as well... it should be in the written scope of work as a part of the Special Diabetes Project.” (NSDP manager, M2)

A training was provided to the NSDP interventionists for the round-two implementation. Intervention materials were provided to initiate the implementation and at the NSDP request thereafter. Additionally, an orientation and training was provided specifically for NSDP managers and supervisors at the request of NSDP leadership. The purpose of this orientation training was to address the concern about pulling the NSDP interventionists from completing their regular duties that raised and remained during the NHS round-one implementation. The orientation training addressed this concern by demonstrating how the specific components of the NHS program could help meet the NSDP goals and objectives for their new grant cycle. The NHS academic team also offered suggestions on how to coordinate future work through incorporating the NHS work with the NSDP new objectives.

However, it proved to be challenging to make the NHS round-two implementation happen, due to NSDP leadership turnover and funding issues. As a supervisor commented,

“In the last meeting, (the PI) has indicated that they won’t provide as much as they did in the round-one. That made me question, where would the things they provided come from? If the program doesn’t have the money to support this, do we really need to continue this program? I think that commitment we need. (The program director) did indicate the Special Diabetes Project will support the program, but he left. Will that be still there?” (NSDP manager, M9)

4.4.2 Partnership Outcomes

(1) Significant adaptation of the intervention content

The formative research and community workshops resulted in significant adaptation of the AHS intervention to the Navajo setting. The main intervention components (stocking of healthier alternatives in local stores, point-of-purchase interactive educational sessions, and mass media promotion) and structure (six-phased intervention) of the AHS intervention were maintained, but the content of the intervention (themes, messages, specific foods and behaviors for promotion, print materials) was modified according to formative research findings and community input (Table 4.2, Table 4.3). A NSDP program manager described the process of material revisions as,

“There were exchanges of some of the posters and materials. She (a graphic designer from the academic team) gave some information and some of us gave comments, suggestions back and forth several times. It might appear minor but small changes made the program a lot more better, culturally sensitive. A lot more care, better to understand on the part of participants.” (NSDP manager, M5)

(2) Limited execution of the intervention components

The NSDP interventionists completed the entire six-phase of the NHS program over a one-year period. However, the execution of the NHS intervention components was limited (Table 4.4). The interventionists were unable to recruit enough small stores

surrounding the five supermarkets in the intervention areas, primarily because small store owners were not interested in the program and the top manager of the Red Mesa stores, which are the major chain of small stores on the Navajo Nation, was unwilling to cooperate. The actual interactive educational sessions in each store happened less frequently than planned, and declined during the later phases of the intervention. But the biggest disappointment seemed to be not getting small stores to stock healthier food options for the program. A member of the NHS academic team expressed,

“We didn’t have a big intervention component in small stores, there wasn’t much changing of the food environment. In other words, there wasn’t much work by these interventionists with the small stores to get them stock the foods. ... I don’t think we were successful in that respect. I think the program was delivered as essentially an education program in the stores, but not as a food environment change. So I think in future work we really need to work with these food stores to get them to stock the foods.” (Academic partner, R1)

The community components of the NHS program, in particular radio announcements rarely happened. But some of the interventionists reported they had been using the NHS materials to do nutrition education in community settings, such as schools, senior centers, and worksites. However, this could create another intervention execution issue concerning potential contamination of different geographic areas of the Navajo Nation as some of the interventionists came from the NHS control areas, and/or their service areas overlapped the control areas.

(3) The extent of program sustainability

The degree of NHS sustainability as a result of the implementation partnership is discussed below according to Shediak-Rizkallah & Bone's (1998) three dimensions of sustainability: maintenance of health benefits, capacity building, and institutionalization. The evaluation of the effectiveness of the NHS program on store customers showed that higher exposure to the NHS intervention was associated significantly improved healthy food intentions, healthy cooking methods, and healthy food getting, and significantly reduced BMI (body mass index) (for more detail see Gittelsohn et al., 2013). However, follow-up evaluations are needed to see if the improved psychological and behavioral outcomes and weight status of these customers is maintained over a longer period of time.

Although the impact of capacity building was not evaluated, the interviews with NSDP managers, supervisors, and interventionists indicated that the NHS program and associated capacity building activities helped increase their knowledge, skills, and capacity to provide better prevention services for the community. For example, the NSDP interventionists consistently expressed that the NHS program provided them better ways to educate and communicate with community members about healthy lifestyle. An interventionist remarked,

“The program has a better idea of what is healthier for the public, how we can work with store managers and others to promote healthy lifestyle. We can ask store managers for setting up other things, not just for the healthy stores intervention. What we’re talking about was getting senior centers, the Department

of Health clients for label reading, bringing them to the stores to do it. ... (The trainings) have enlightened me. I got a lot of ideas, positive ways of educating people from them (the NHS academic team).”(NSDP interventionist, I7)

Some the NSDP interventionists and supervisors reported that the interventionists taught their peers about the NHS educational sessions and shared NHS materials for their work. A NSDP supervisor also remarked on a potential incorporation of the NHS concepts of promoting healthy alternatives and healthy choices,

“We can transfer these concepts into schools to begin to make an impact, such as meal planning, not only healthy choices but also healthy menu planning. People here have low income. What alternatives are there? We need to explore these alternatives.” (NSDP manager, M9)

Many NSDP program managers and supervisors expressed that the NHS capacity workshops, esp. the evaluation workshop helped them realize the importance of data collection and evaluation. A program manager commented,

“We do a pretty good job of counting things, how many presentations we did? But we really don’t take a step back and take a look at how we affect or change our community or anything like that. And I’m trying to help people start thinking about the services that we provide in these terms. ... (The evaluation workshop) really made me to stop and think about the services we provide, and what services we’re providing are appropriate. Are they effective? We need to ask these questions.” (NSDP manager, M4)

In terms of institutionalization, our data indicates that the NHS program did not become part of the NSDP routine operations in the end of the round-one implementation. At the practitioner level, three NSDP interventionists continued to implement the NHS interactive educational components in their service areas up to 2 years, but discontinued due to leadership turnover and changes in program priorities (Personal communication with the NHS field coordinator). However, there are some indications that the NSDP interventionists continued to use some of the NHS materials and concepts to educate community members to this day. For example, some interventionists still call the field coordinator to ask for certain materials.

In summary, there were indications that some components (esp. interactive educational sessions and intervention materials) of the NHS program were sustained in the setting, and the knowledge, skills, and capacity gained from the NHS capacity building activities may serve the NSDP for a longer time.

4.5 DISCUSSION

To our knowledge, this is one of the first studies to examine the academic-community partnership process of translating a nutrition intervention trial to a locally implemented community program. Our findings support the four stage partnership development process proposed by Cargo & Mercer (2008) by naturally falling into the four consecutive stages: engagement, formalization, mobilization, and maintenance.

During the engagement stage, formative research and community workshops were conducted to engage various community stakeholders, to gain support for the program, and to facilitate community ownership and sustainability of the program. The formative

research and community workshops also facilitated building trust and relationships with potential community partners and the identification of NSDP as a host organization for the program. The importance of assessing the setting in which an intervention was introduced, including organizational needs, capacity and readiness, and innovation-organizational fit has been recognized by many researchers (Fixsen et al., 2005; Feldstein & Glasgow, 2008; Greenhalgh et al., 2004; Kilbourne, Neumann, Pincus, Bauer, & Stall, 2007; Rogers, 2003; Stith et al., 2006). In our study, having an extensive formative research phase and a field coordinator familiar with the host setting facilitated mutual understanding of needs and capacity of partners, establishing relationships and trust, and discovering potential for collaboration that would be mutually beneficial. Adapting the intervention to fit the host setting is a critical step for successful implementation (Meyer et al., 2012a). In our study, a planned adaptation was occurred prior to implementation through community workshops. Planned adaption can resolve the tension between the need for fidelity and adaptation (Lee, Altschul, & Mowbray, 2008).

Formalization occurred when a partnership agreement was established between the academic team and NSDP to share their resources and expertise. And capacity building was a key part of the partnership agreement to improve organizational capacity. NSDP leaderships engaged in decisions on interventionist selection, program management, training and capacity building, which is critical to build ownership and commitment (Lantz, Viruell-Fuentes, Israel, Softley, & Guzman, 2001; Teufel-Shone, Siyuja, Watahomigie, & Irwin, 2006).

The mobilization stage consisted of staff selection and training, ongoing implementation support, capacity building and buy-in. There is strong evidence in the literature for the importance of training and ongoing technical assistance (Fixsen et al., 2005; Greenhalgh et al., 2004; Kilbourne et al., 2007; Stith et al., 2006), and evidence indicates that the combination of training and ongoing support can enhance the quality of implementation (Miller, Yahne, Moyers, Martinez, & Pirritano, 2004; Sholomskas et al., 2005). In our study, ongoing support for implementation was accomplished through booster trainings, regular teleconferences, and field facilitation. Three integral parts of these support strategies were the monitoring of implementation progress, identifying problems and issues, and the provision of technical assistance and feedback along with the use of process data. Studies suggest that early monitoring of implementation can identify problems, and that timely provision of assistance and feedback can lead to significant improvement in implementation (DuFrene, Noell, Gilbertson, & Duhon, 2005; Greenwood, Tapia, Abbott, & Walton, 2003).

The importance of building organizational capacity and fostering a supportive organizational climate is well documented (Durlak & DuPre, 2008; Fixsen et al., 2005; Greenhalgh et al., 2005; Wandersman et al., 2008). Interestingly, we found that NHS capacity building trainings also served as a mean of building support for the intervention implementation within NSDP. Capacity building workshops were logistically as well as strategically arranged next to booster trainings. However, some supervisors remained unsupportive of the work related to the NHS program.

The maintenance stage involved reflecting on the NHS implementation experiences and discussed lessons learned, sharing research results with NSDP, providing training and materials for the next round of implementation, and exploring ways to sustain the program within NSDP. In terms of Shediak-Rizkallah & Bone's (1998) three dimensions of sustainability, our findings indicates that some components (esp. interactive educational sessions and intervention materials) of the NHS program were sustained in the setting, and the knowledge, skills, and capacity gained from the NHS capacity building activities may potentially serve NSDP for a longer time. There is a need to evaluate the maintenance of program effects gained during the NHS round-one implementation.

Finally, our findings suggest that there were some key challenges needed to address as the academic-community partnership moved along the stages of implementation. These challenges included engaging and gaining support from important community stakeholders, buy-in at the administrative level, clarity of direction and management of program, ensuring compatibility of program management with the organizational structure, ensuring necessary structural and procedural support in place, ensuring sufficient and timely monitoring and feedback on implementation, overcoming leadership turnover, securing funding, and gaining unanimous support within the host organization. A close examination of these factors revealed that the interactions among these factors had a significant impact on the function and outcomes of the partnership implementation effort (see Chapter 5).

There are limitations to this study. This study serves as one case study understanding the process of translating an academic-derived food store-based intervention trial to a sustainable, community-operated intervention. Therefore, the generalizability of the findings to other settings is limited. Additionally, this study focused on the partnership between the host organization (NSDP) and NHS academic team, while food stores were also important partners in the NHS implementation effort. However, given that the NSDP served as a host organization for the NHS program to deliver intervention activities and active engagement of NSDP leaders and staff throughout, this study was warranted to examine closely the partnership with NSDP alone and understand why it was crucial for program success. We examined store owners/managers' perspectives on the program and its implementation in Chapter 6 of this dissertation.

In summary, this study has shown that the academic-community partnership for implementation of the NHS program evolved through an engagement, formalization, mobilization, and maintenance process, but there were important challenges needed to address in order to successfully move through the stages of implementation. This study contributes to the growing literature of implementation science by demonstrating the process and strategies used by an academic-community partnership to implement an environmental nutrition intervention in a systematic fashion. Future efforts to implement evidence-based nutrition interventions through an academic – community collaboration in American Indian contexts should apply the principles of community-based

participatory research (Chino & DeBruyn, 2006; Israel, Schulz, Parker, & Becker, 1998)
to established mutual trust and respect and facilitate the implementation process.

Figure 4.1. Conceptual framework for stages of academic-community implementation partnerships

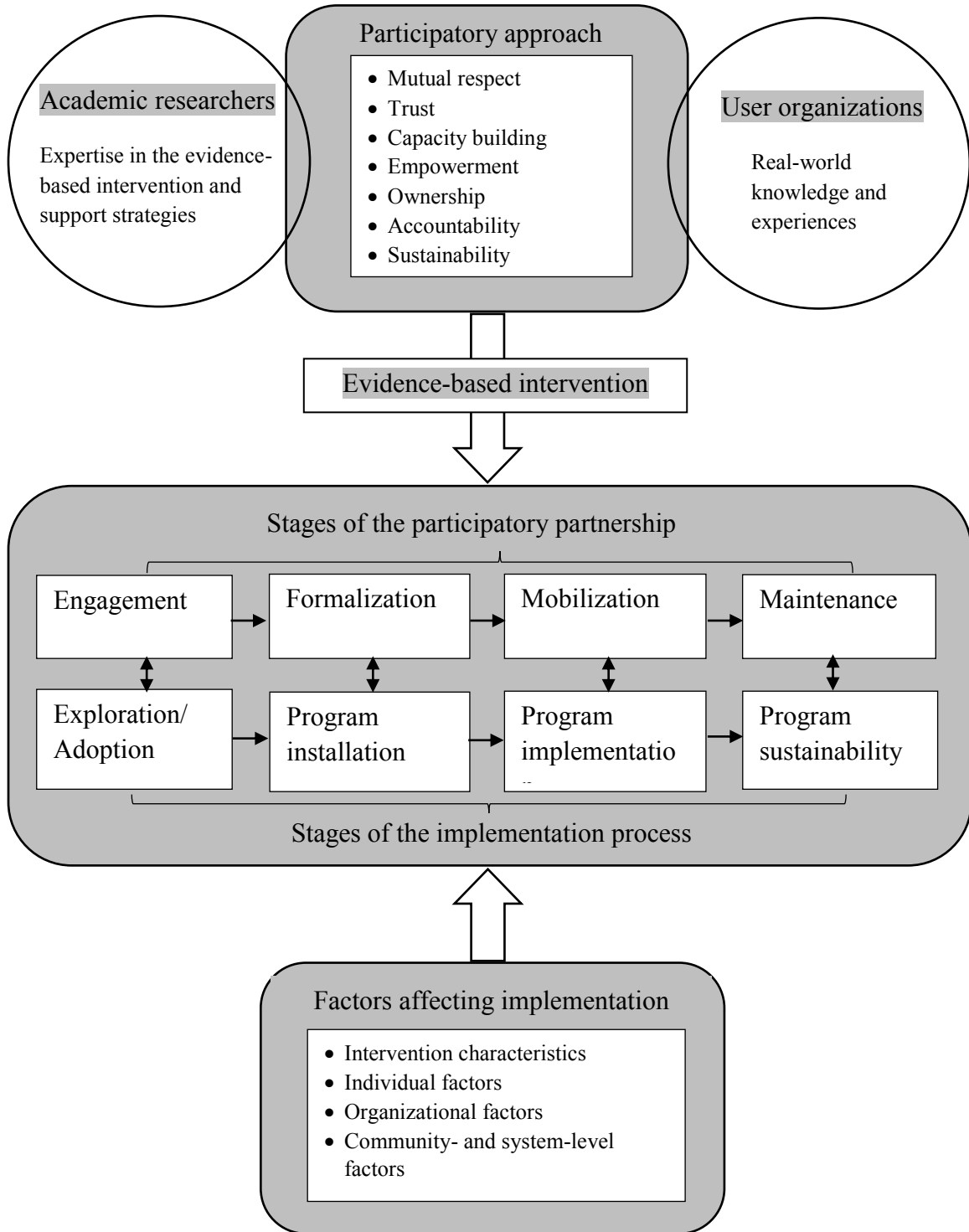


Table 4.1. Components, activities, key challenges, and outcomes of NHS implementation partnership process

Partnership stage	Components	Activities	Key challenges	Partnership outcomes (in relation to implementation)
Engagement	<ul style="list-style-type: none"> • Formative research • Community workshops • Relationship building 	<ul style="list-style-type: none"> - Assessed community food environment, diet quality, food behavior - Identified community programs on healthy eating - Introduced the NHS program to Navajo communities - Developed/modified intervention approaches and materials - Identified the NSDP leadership - Discussed the needs and opportunities for collaboration 	<ul style="list-style-type: none"> - Engaging and gaining support from important stakeholders 	<ul style="list-style-type: none"> • Significant adaptation of the intervention to the Navajo setting
Formalization	<ul style="list-style-type: none"> • Partnership agreement 	<ul style="list-style-type: none"> - Developed memorandum of understanding - Developed timelines for implementation - Engaged NSDP in decisions on interventionist selection, program management, training and capacity building 	<ul style="list-style-type: none"> - Buy-in at the administrative level - Ensuring clarity of direction and management of the program 	<ul style="list-style-type: none"> • Top-town decision on program implementation
Mobilization	<ul style="list-style-type: none"> • Staff selection and training • Implementation support • Capacity building • Buy-in 	<ul style="list-style-type: none"> - Trained interventionists - Designated a program manager - Allocated funds for supply - Provided pre-implementation training - Provided booster trainings - Established monitoring and feedback mechanism - Garnered support from other community partners (i.e., I.H.S community nutritionists) - Provided field facilitation - Collected process data - Provided capacity building workshops for program managers and supervisors - Invited supervisors to booster trainings 	<ul style="list-style-type: none"> - Ensuring compatibility of program management with the organizational structure - Ensuring necessary structural and procedural support for the interventionists in place - Ensuring sufficient and timely monitoring and feedback on implementation 	<ul style="list-style-type: none"> • Limited execution of the intervention

Table 4.1. (continued)

Maintenance	<ul style="list-style-type: none"> • Feedback • Ongoing support • Sustainability 	<ul style="list-style-type: none"> - Presented research findings and discussed lessons learned - Provided training to initiate round-two implementation - Provided intervention materials at NSDP request after funding ended - Provided a NHS orientation and training for the NSDP managers and supervisors - Explored future funding opportunities and the possibility of inclusion in the NSDP strategic plan 	<ul style="list-style-type: none"> - Overcoming leadership turnover - Securing funding - Gaining unanimous support 	<ul style="list-style-type: none"> • Round-two implementation up to 2 years • Some indications of continued use of the NHS materials and concepts by interventionists
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Table 4.2. Comparisons of intervention phases between the AHS and NHS programs

Intervention program	Teaser phase	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
AHS	Introduction to AHS	Eating healthy snacks	Start the day with a healthy breakfast	Cooking and eating with less fat	Quick and healthy dinners	Drinking healthy beverages	Healthy lunches and snacks
NHS	Introduction to NHS	Healthy Beverages and Breads	Healthy Cooking Methods; Better Potatoes	Healthier Luncheon Meats; Eat in Moderation	Better Healthier Meals	Healthier Snacks and Desserts	Planning Ahead; Healthy and Affordable Meals

AHS, Apache Healthy Stores; NHS, Navajo Healthy Stores

Table 4.3. Comparisons of intervention contents between the AHS and NHS programs, according to related phase

Related phase	Theme	Target behavior	Promoted foods (minimum standard)	Messages (examples)
AHS Eating healthy snacks	Label reading Character motif	Reading labels Recognizing store intervention materials	Pretzels Low sodium pretzels Baked potato chips Baked tortilla chips Saltine crackers Fresh fruits	Know what you're eating Read the food label Labels are a rainbow of information
NHS Healthier Snacks and Desserts	Choose the right healthy snacks and desserts Eat fresh fruits and vegetables	Choose fresh fruit for snacks and desserts Eat baked chips and pretzels for snacks Read the food labels	Baked chips and pretzels Fresh fruits and vegetables Granola bars	Baked chips or pretzels are healthier and low fat Fill in the gaps with healthy snacks Know what you're eating Read the food label
AHS Start the day with a healthy breakfast	Start the day with a healthy breakfast	Consume low fat or skim milk and lower sugar cereals	2% milk, 1% milk, skim milk Low-sugar cereals	Low fat and skim milk contain all the nutrition without too much fat

Table 4.3. (continued)

		Eat fresh fruits for breakfast	High fiber cereals Fresh fruits	A healthy breakfast gives you energy
NHS Healthier Luncheon Meats; Eat in Moderation	Lower fat luncheon meats Moderation	Choose lower fat luncheon meats Reduce added fats, like mayonnaise Reduce the amount you eat; portion control Drink plenty of water every day, especially before meals Eat more fresh fruits and vegetables	Low fat luncheon meat Water	Let's go fishing, it's better than spam Then steam or grill your cuts Eat smaller portions to help you stay trim Cook smaller amounts, only enough for the family 5 Choose lower fat luncheon meats
AHS Cooking and eating with less fat	Cooking spray and clean up The many uses of cooking spray Let the truce taste shine through (less added fat)	Proper use of cooking spray Reduce added fats Use less butter	Cooking spray Eggs Potatoes	Cooking spray has many uses Fry less, reduce mess

Table 4.3. (continued)

NHS Healthy Cooking Methods; Better Potatoes	Healthy ways to cook at home	Use cooking spray or canola oil for frying Drain & rinse ground beef Buy leaner cuts of meat Use healthier cooking methods i.e., bake, grill, steam or boil	Cooking spray or canola oil Smaller potatoes Leaner meats	Why use cooking spray? Cooking spray is the healthiest way to fry Be kind to your heart, use cooking spray Stop frying; better to grill or bake
AHS Making healthy dinners	Make quick healthy dinners at home Drain and rinse ground meat when you cook Eat smaller meals at restaurants	Choose pork and beans versus regular chili Choose smaller portion sizes when eating out Drain and rinse ground meat Choose lower fat ground meats	Pork and beans Corn (frozen or canned) Onions Healthy deli offerings Cooking spray Lean ground beef	Supersizing doesn't pay Eat less for better health Be lean, it's less mean on your heart Drain and rinse the fat away
NHS Better Healthier Meals	Preparing and eating healthier meals Eating together as a family	Prepare healthy meals at home Eat together as a family Choose salad, fresh	Salad Fresh fruit and vegetables Leaner meats and fish	Eating together as a family Make it a tradition Put some greens in your

Table 4.3. (continued)

		vegetables & fruits Bring your lunch from home		genes “Go for the greens!” Eat vegetables for a healthy heart Choose salad, fresh vegetables and fruit
AHS Drinking healthy beverages	Drinking healthy beverages	Drink water and diet sodas rather than regular sodas and other high calorie drinks	Diet soda Water	Drink water to really stop your thirst, it costs a lot less
NHS Healthy Beverages and Breads	Drink water or Low-calorie drinks ie., diet soda Eat whole wheat or blue corn pancakes and breads	Choose healthier drinks and healthier breads	Water Diet soda Low-calorie drinks Whole wheat bread	Water is life Low calorie drinks are healthier, have less sugar Whole wheat or blue corn breads are higher in fiber and healthier
AHS Shop wisely, eat 5 fruits & veggies a day	Healthy snacks (fruits & veggies w/low fat dips) How to shop	Eat fruits and vegetables for snacks Use food labels and shelf labels when	Fruits Vegetables Fat free dressing and dips	It’s easy to eat five fruits and vegetables a day Slam dunk more fruits and vegetables

Table 4.3. (continued)

		selecting foods		Shop wisely – use a list! Shop wisely – read food labels!
NHS Planning Ahead; Healthy and Affordable Meals	Planning meals using a shopping list How to shop smart and save money Reading food labels	Make a shopping list, stay within your budget Plan ahead and prepare healthy meals Use food labels and shelf labels when selecting foods Choose healthy items that are fresh and low in fat	Lower fat or fat free foods Fresh fruits and vegetables Lean cuts of meat or fish	A shopping list saves you money Don't get lost in the shuffle, plan your meals ahead Know what you are eating - read food labels!

AHS, Apache Healthy Stores; NHS, Navajo Healthy Stores

Table 4.4. Actual vs. planned intervention implementation of the NHS program

Intervention implementation	Store recruitment	Interactive educational sessions	Stocking of healthy alternatives	Radio announcements
Planned	5 large stores 3-4 small stores (in total 15-20 small stores)	At least one time per week in each store	Minimum quantities of promoted healthier food items during each phase in each store	1-3 announcements per phase
Actual	5 large stores 1-3 small stores (in total 10 small stores)	Once every 2-4 weeks	Only limited stocking of key promoted foods in small stores	1-3 announcements for phase 1- 2 only, no announcement for phase 3-6

CHAPTER 5: FACTORS AFFECTING AN ACADEMIC – COMMUNITY PARTNERSHIP FOR IMPLEMENTATION OF A STORE –BASED NUTRITION INTERVENTION (PAPER 2)

Target journal: American Journal of Public Health

5.1 ABSTRACT

The retail food environment plays a key role in limiting access to and availability of healthy foods in AI settings. Changing the food environment in these AI communities may be a feasible way to impact diet quality and reduce obesity and chronic disease risk. The Navajo Healthy Stores (NHS) program was a food store-based intervention on the Navajo Nation and implemented by a collaborative partnership between Johns Hopkins Center for Human Nutrition and Navajo Special Diabetes Program (NSDP). The purpose of this study was to examine the partners' experiences with implementing the NHS program and identify key factors that have affected the implementation partnership. A qualitative study was conducted using a combination of semi-structured interviews with 24 key stakeholders and program document review as primary sources of data. We identified four important facilitating factors and three key challenges for the implementation partnership. Facilitating factors include trust in the academic partners' experience and commitment to sustainability, being responsive to the partner's interests in capacity development, having a program champion, and having a dedicated and experienced field coordinator. Challenges for the partnership include fitting into staff job schedule, obtaining buy-in from critical stakeholders, and overseeing implementation.

Understanding key factors that affect the implementation partnership can help guide academic researchers and community practitioners in developing implementation partnerships and navigate more effectively the complex process of implementation.

5.2 INTRODUCTION

Obesity affects American Indian (AI) children and adults in a higher proportion than any other racial/ethnic group (Liao et al., 2003; Slattery et al., 2010). Poor diet quality is widely recognized as one of the major causes of obesity among AI (USDHHS, 2007). The retail food environment plays a key role in limiting access to and availability of healthy foods in AI settings (O’Connell et al., 2011; Odoms-Young et al., 2012; Pareo-Tubbeh et al., 2000). Most AI reservations are rural, and have limited access to diverse food outlets (Gittelsohn & Sharma, 2009). Large supermarkets are rare on most AI reservations, and most AI are dependent on convenience or gas-station stores, which primarily stock unhealthy snack foods and rarely carry fresh produce, and offer a range of ready-to-eat foods (Gittelsohn & Sharma, 2009; Gittelsohn & Rowan, 2011). Changing the food environment in these AI communities may be a feasible way to impact diet quality and reduce obesity and chronic disease risk. Food store-based intervention trials have shown potential to improve availability and consumption of healthy foods and to reduce obesity and related chronic conditions in underserved populations (Curran et al., 2005; Escaron et al., 2013; Gittelsohn et al., 2012b; Ho et al., 2008; Rosecrans et al., 2008; Vastine et al., 2005).

The Navajo Healthy Stores (NHS) program was a store-based intervention on the Navajo Nation developed through extensive formative research and a community

engagement process, based on a previous intervention trial (Curran et al., 2005; Vastine et al., 2005). NHS was implemented by a collaborative partnership between Johns Hopkins Center for Human Nutrition and Navajo Special Diabetes Project (NSDP), a community health organization funded under the Special Diabetes Program for Indians (SDPI) (Community-directed) Grant Program for diabetes prevention and treatment services. NSDP provided personnel and resources to carry out NHS intervention activities, and the university provided intervention materials, giveaways, trainings, technical assistance, and program evaluation. The NHS program consisted of a six-phase intervention, each phase lasting 6-10 weeks focused on different foods and behaviors for promotion, with interactive sessions at local retail food stores through cooking demonstrations and taste testing of healthier food alternatives for community members. The evaluation of the effectiveness of the NHS program on store customers showed that higher exposure to the NHS intervention was associated significantly improved healthy food intentions, healthy cooking methods, and healthy food getting, and significantly reduced BMI (Gittelsohn et al., 2013).

The purpose of this study was to examine the experiences of the academic team and NSDP staff members with the NHS program and identify key factors that have affected the implementation partnership. Specifically, we conducted a qualitative study to understand (1) how and what factors have facilitated the partnership effort to implement and sustain the program, and 2) how and what factors have hindered the partnership effort to implement and sustain the program.

5.3 METHODS

5.3.1 Study Setting

The Navajo Nation encompasses 24,078 square miles in northern Arizona, New Mexico, and southern Utah, and is the largest Indian Reservation in the US (NDOH, 2004). Most of the population lives in rural isolated homesteads of several related households surround by dry land. A few of the towns on the reservation have large grocery stores but the majority of them have a trading post or convenience store. Thus, the NHS program planned to utilize the available environmental resources by conducting interventions in grocery stores, trading posts, and convenience stores.

5.3.2 Participants and Procedures

Participants for this study were the members of the NHS academic team and NSDP, who were either decision makers or involved in the implementation of the NHS program. They included the NHS principal investigator (PI), the NHS field coordinator, NSDP program managers, supervisors, and interventionists. A total of 24 individuals were interviewed by the researcher in a private office at their workplaces. Signed consent was obtained from all participants. A semi-structured interview guide was used during the interviews. Topics covered included: program initiation, intervention adaptation, implementation, sustainability, program facilitators, barriers, and impacts.

There was no audio-taping of interviews with local stakeholders because of participants' preferences to remain completely anonymous, and because of time constraints to obtain the Navajo Nation Human Research Review Board (NNHRRB)

approval for audio-recording at the time this study was conducted. The researcher wrote down interview responses, and made every effort to capture actual phrases and sentences used by the participants. The duration of interviews ranged from 30 minutes to 2 hours, but most of the interviews lasted about 1 hour. The interviews took place from March 25 to May 15, 2009. This study was approved by both the Johns Hopkins University Institutional Review Board (IRB) and the Navajo Nation Human Research Review Board (NNHRRB).

Program documents were reviewed to reveal the complexity of partnership development and implementation process and to understand the experiences and perceptions of study participants in the program context. These documents included program meeting and teleconference minutes, formative research reports, community workshop reports, the interventionist manual of procedures, presentation slides for training and capacity building workshops, progress updates and reports, and journal articles.

5.3.3 Data Analysis

Data were analyzed thematically, using the template approach (Crabtree & Miller, 1999; King, 2004). With guidance from the research questions and the interview guide, the researcher constructed a coding template through careful reading and rereading of the interview responses. These preliminary codes were revised multiple times by the researcher working back and forth between the data and the coding template. The accuracy and clarity of the coding template was checked twice with a research assistant who had a qualitative data analysis background by independently coding four sets of

interview responses each time. Some adjustments were made to the coding on the basis of their discussions as well as a detailed rereading of the full set of interview responses to produce the final version of the analytical template. Themes that were of direct relevance to the study questions was presented below.

5.4 RESULTS

Findings that describe factors that facilitated the academic - community implementation partnership are presented first, followed by a description of challenges or barriers that hindered the partnership process.

5.4.1 Facilitating Factors

(1) Trust in the academic partners' experience and commitment to sustainability

Experiences of the academic partners with other tribes helped to develop a trusting relationship with the Navajo Nation and the host organization. The principal investigator (PI) of the project had nearly 20 years of working experience with American Indian communities and had successfully conducted store-based interventions in multiple settings. A program manager recalled,

“Johns Hopkins experiences with other tribes were very helpful to convince the Navajo Nation to participate. ... He (PI) covered the Apache Healthy Stores program. He mentioned the programs in Marshall Island, tribes from Canada, and also a couple of other 6 to 7 programs in the South or Midwest. I remember specifically Marshall Islands' Spam diet observations and changes in behaviors,

modification of behaviors that was the selling point for me.” (NSDP manager, M5)

Furthermore, the partnership was facilitated by the academic partners’ commitment to program sustainability and long term collaboration. A supervisor remarked on the academic partners’ effort to ensure successful implementation,

“I’ve had meetings with them. They’re always trying to figure out how to improve the program. ... I don’t know if they did it themselves, but they sort of knew what’s going on in the field. They sort of have people to tell them. But they did share some experiences from other tribes. I guess you just learn as it goes. ... All and all, they’re trying to correct them when we’re running into problems. Overall we’re able to learn, overcome problems.” (NSDP supervisor, M1)

As the goal of the collaborative partnership was to establish a self-sustained healthy stores program, the academic partners committed to providing continuous training to the host organization beyond the project funding period. As an academic partner stated,

“I’ll go out again as soon as I get another grant. So advantages of my getting a grant, even it’s unrelated to this work, is that it means if I get another grant work with Navajo, it means I’ll keep going out there, I can keep supporting the activities and efforts, and that’s what I’d like to do.” (Academic partner, R1)

(2) Being responsive to the partner’s interests in capacity development

An important facilitating factor for the implementation partnership was addressing specific needs of the host organization beyond program implementation. During the planning stage of the project, the leadership of the host organization explicitly expressed their interests in evaluating program activities and improving organizational capacity in collaboration with the academic partners. As an academic partner explained,

“(They’re) for the possibility of providing some evaluation, and both of them seeing from Indian Health Services is that there’s going to be a real big demand, and still is a big demand for evaluation work, and to evaluate their program and so forth ... and part of the set up was to provide capacity building activities. And I think they were excited about that possibility to have that happened.” (Academic partner, R1)

Five capacity building workshops were provided throughout implementation by the academic partners as requested by the host organization. A program manager (M7) commented on the impact of these trainings on their program, *“Johns Hopkins University strengthened our nutrition goals by education, by training, by assisting how to evaluate our activities”*. The academic partner explained the importance of being responsive to the needs for capacity development to the partnership,

“I think all those trainings and capacity building that’s something that even though you may look back in your original proposal was there, in my mind I don’t know if I really thought it was going to be as important or central as it actually was. In some ways when you think about the work of the project, that was more the work of the project than the implementation of the program in some

ways. That was as important that those things happened as much as the program itself was implemented.” (Academic partner, R1)

(3) Having a program champion

Another important facilitating factor for the partnership was the presence of a program champion, who was motivated to develop an evidence-based project through the academic – community partnership. In the early stages of the project, the senior nutritionist at the central administration played an important role in garnering support for the project within the host organization and promoting the program to other partners. As he described his role as,

“I think the first task was to sell the concept to the staff; next, to formally understand the university and the program. My role was coordinating between the university and our office, disseminating information on all materials, instruments to be used, scheduling activities, and expanding the program to other partners, i.e., small stores. Some activities that’s necessary to get the project done.” (NSDP manager, M5)

According to an academic partner (R1), he was “operationally supportive in a sense that he had a lot of enthusiasm, wanted to get things going” and “the one who really spearheaded, made the effort to make the collaboration work.”

When the implementation began, he inspired and led intervention staff to implement the program, as well as reassured they were doing a good job and felt supported. An intervention staff (I1) remarked, “(he) was all for it. He was our

supervisor at that time. He wanted to let us go out there to do the stuff.” However, he left the host organization for a new position in the middle of implementation and his responsibilities were assigned to another manager subsequently. An academic partner remarked on the importance of his role,

“He went around to the stores. He would go out with the interventionists, nutritionists, made sure they deliver the program and he was really supportive. And they loved it. That was first four or five or six months or whatever. And then he left and things changed. And then (the field coordinator) had to really step in and provide a lot of that support. So I think program champions are really important.” (Academic partner, R1)

(4) Having a dedicated and experienced field coordinator

The partnership was also greatly facilitated by hiring a local field coordinator, who was familiar with the local culture and practices, spoke Navajo, and had prior working experiences with both the academic partners and the host organization on other research projects. An academic partner explained the importance of having the field coordinator,

“It’s always difficult to make things happen if you’re not there and if you’re not able to speak the language. And I think those demonstrate some big challenges regardless. So I mean I think there may be some sort of traditional kind of relationships that still cause some issues. But that’s why it is so important to have someone like (the field coordinator), who is Navajo speaking and who is the

member of the tribe. And who's there able to put in time, energy and effort to manage these relationships.” (Academic partner, R1)

While the field coordinator initially served as a liaison between the university and the host organization, gradually she played a more active role in implementation and supporting intervention staff. As she described her role,

“I helped to move the process along, like coordinating phases, made sure they got supplies and materials go to next phases, and helped to share information among interventionists. They called me (and said) ‘I can’t work because I’m out of posters, flyers, incentives’. I made sure to have the incentives for them to do the intervention, made sure (the program director and manager) got information. I emailed them a lot to update intervention progress, informed (the PI) everyday problem issues, and eliminated adverse events. I resolved it immediately so it won’t become a big problem.” (Academic partner, R2)

5.4.2 Challenges or Barriers

(1) Fitting into staff job schedules

As the healthy stores program was implemented by existing staff (primarily nutritionists) of the host organization, it was challenging to fit the intervention activities in their job schedules. As an intervention staff described,

“We’re told to do the healthy stores intervention on a weekly basis. We had to do our job what we scheduled to do. I had to balance what’s the best time to do the

intervention. I actually had to do a lot of time management just to fit it in my daily schedule.”(NSDP interventionist, I10)

The time element concerned both field supervisors and the academic partners. On one hand, supervisors expressed their concern about taking away intervention staff from their established scope of work. A program manager remarked,

“The concerns were that we’re pulling our nutritionists from completing their stated goals and objectives with our contract with the Indian Health Service ... that we needed to spend our time on what they felt nutritionists should be doing: nutrition education, health care, and food demos.” (NSDP manager, M7)

On the other hand, while the academic partners understood demanding schedules of intervention staff, they were concerned about the intensity of intervention delivery. As an academic partner explained,

“The main concern has been the intensity of delivery of the intervention. The fact that the interventionists only delivered may be once a month or once every two or three weeks, when it should’ve been delivered weekly, that was the original scheme. ... But you know in the end it was what could they do. Their schedules, their everything else that they were required to do for their jobs, this is how much they were able to dedicate.” (Academic partner, R1)

Additional data collection and reporting requirements also presented a challenge. The academic partners required intervention staff to complete an interventionist log designed to measure intervention implementation (esp. dose delivered, dose received,

reach and fidelity). Additionally, in order to take the work relating the NHS program into staff monthly report to meet their performance standard, the host organization required intervention staff to record the name of program participants. However, due to a relatively large number of program participants in interactive educational sessions (on average, 70 per intervention session and supermarkets having more participants than smaller convenient stores), intervention staff often needed another person to complete the data collection. An intervention staff explained,

“We’re required to record people’s name in order to get credit for our job ... when I was doing the healthy stores intervention, I was paying attention to the presentation, busy with my presentation. I just couldn’t record their names. Other people around, they just walked away before I recorded their names, no way to do that.” (NSDP interventionist, I1)

An academic partner also expressed frustration with having incomplete interventionist logs,

“They were required to fill out forms for each time they went out. Then they did it but they filled it out incorrectly a lot of times. Unfortunately it was very frustrating to me ... they frequently didn’t do tick marking some of the sections where they were supposed to do it. So a lot of those data were not usable.” (Academic partner, R1)

(2) Obtaining buy-in from critical stakeholders

While the decision to implement the healthy stores program was made by the top management of the host organization, it proved to be critical to engage field supervisors in all aspects of implementation and to have their full support. An academic partner remarked,

“I really had hoped for much stronger implementation than actually done. Part of the reason (was) that people (intervention staff) didn’t feel supported by their supervisors to do this. ... I think it remains a problem at the very end even to this point that those middle level folks didn’t buy in as much.” (Academic partner, R1)

Several factors appeared to contribute to supervisors not being supportive of the program. First, there was lack of early involvement and regular communication. Majority of supervisors did not get involved with the project from the beginning (esp. the development and planning phase), and a few supervisors were newly hired after implementation started. As a result, supervisors were not very familiar with the project and its goals. An academic partner remarked,

“I think program managers and supervisors need a little handbook that explains why we do this program, what are its goals and objectives. We have it in the manual of procedure but that’s for interventionists. Supervisors should have that handbook to know what we are doing.” (Academic partner, R2)

In addition, as the project was coordinated through the central administration and through conference calls with intervention staff, supervisors felt they were out of the loop. A supervisor (M10) stated, *“As partners with the Healthy Stores Program, (the field*

coordinator) and (the program manager) in Window Rock should run smoothly, inform supervisors about what's going on".

Second, it was difficult to establish connections with the existing program objectives. Although the healthy stores activities were incorporated into the staff performance evaluation, it was considered by some supervisors as a 'separate project' or 'additional responsibilities' that were not in their written scope of work. As a supervisor (M2) explained, *"Scope of work is our program objectives, what we're supposed to do with the proposal. I'm not sure the healthy stores program is part of it"*. A program manager agreed,

"I think the way it was introduced to them as another program on top of what they're doing... had some negative effects. That's why supervisors were not supportive of the Healthy Stores Program, that's why I'd like to see program managers to fully make use of their interventionists, provide their service."

(NSDP manager, M6)

Furthermore, as mentioned in the previous paragraph, a lack of familiarity with the healthy stores program presented a challenge in making connections with existing program objectives. When asked the connections between the two programs, the program manager (M6) remarked,

"I'm trying to remember if I've seen or read the Healthy Stores Program goals and objectives. I have to go back to see and compare with ours in the area of nutrition related activities."

Third, challenges existed in clearly communicating the values and benefits of the program for community. While the academic partners explicitly and repeatedly stated the specific goals and objectives of the project throughout the project period, some supervisors still expressed concern about the intention of the project and questioned the ‘real benefits’ of the project. As a supervisor stated,

“I think they need to more clearly communicate what’s project doing, what’s the benefit to people here, or it’s just beneficial to people monitoring the project. ... Hopefully, there is going be an in depth explanation of the project. I think most important to know real benefits of the project, or it’s just a study, just following certain individuals’ behavior, certain food eating.” (NSDP manager, M2)

This supervisor also remarked on how academic language or terminology and Navajo culture and communication style (‘they say nothing even they don’t understand what people (experts) are talking’ as she put it) might influence on effective communication between the two partners. Some supervisors expressed they would support the program if it could show an impact on consumer behaviors. As a supervisor (M8) remarked, *“I think if we can measure some impacts, I would certainly advocate for it, continue to work at stores”*.

(3) Overseeing implementation

The NHS program was overseen by a central office administrator (program manager) of the host organization in coordination with the academic partners. Due to frequent turnover of central office administrators and a lack of clarity in their roles and

responsibilities in the program, oversight of implementation was less than optimal. As an academic partner (R2) stated,

“Changes in personnel really affected our program. They had three turnovers of program managers. ...We had agreement with the first manager, but he was gone. After that there was no agreement. But the next one felt other program pushed on them that just assigned already. They probably felt don’t know how to do it.”

(Academic partner, R2)

A program manager remarked on a lack of documented roles and responsibilities for the program,

“I don’t know what authority does this person have, when, where does this person make decision on, even in the field how to make sure to get staff involved. Something in written should have been drafted when the program was initiated.”

(NSDP manager, M6)

In addition, a lack of understanding of the program objectives and mechanism also affected effective oversight of implementation by succeeding program managers. As an intervention staff (I1) remarked, *“If they had been there from the beginning to understand the program, they would have pushed a little more. Not as much as (the first program manager) knows what’s happening.”* One of the program managers (M4) said, *“Unfortunately I just didn’t have any time to go into any detail about the program mechanism things like that.”*

Furthermore, necessary structural and procedural support for intervention staff was not in place prior to the onset of implementation. First, job descriptions were not updated to include NHS related activities. Because of this, some supervisors were not supportive of their intervention staff spending time on the NHS program. Second, the work related to the NHS program was not incorporated into the standard reporting system until later on and there was a lack of clarity in compiling different reporting formats. A supervisor described challenges in compiling monthly reports,

“The (reporting) formats were different. ...They didn’t know how to handle it. They’re just kind of deal with it when it came. Nobody knew; no written thing how to do it.” (NSDP manager, M1)

Thirdly, there was lacking of coordination and building support from other community partners. As a supervisor stated,

“I wish I was far more collaborative with WIC, Health Education Program, not just Special Diabetes Program trying to implement the Healthy Stores Program, probably involving other education programs in cost sharing, taking turns.”
(NSDP manager, M8)

Lastly, resource allocation and budgeting was also a challenge for the partnership. Intervention staff reported challenges in not having purchase orders for food items for intervention activities and in getting reimbursed by the tribe for the travel related to implementation. A program manager (M6) said, *“These types of items were not considered when we put up budget together”*

Prior to the onset of implementation. The academic partners also had issues with planning and resource. As an academic partner explained,

“It would have been hard to do more than they did, because they ran out of our intervention promotional items so quickly. I had sort of thought it would be at the same level as sort of Apache experience, where you go to a store after a couple of hours may be you keep thirty or forty people, may be fifty sixty. They would get a hundred fifty people. I would’ve given them what I thought was the entire supply of, water bottles for the entire phase, then they would run out in one session. So part of it my own planning and resource issue is that we just didn’t have enough of the giveaways for people.” (Academic partner, R1)

5.5 DISCUSSION

This is one of the first studies to examine the factors associated with implementation partnerships between academic researchers and community-based organizations. Academic – community partnerships can be a viable approach to translate public health intervention trials to sustainable, community implemented programs (Wallerstein & Duran, 2010). We identified several factors that help guide academic researchers and community practitioners in developing effective partnerships and navigate more effectively the complex process of translation and implementation.

Establishing and maintaining the needed trust and respect are essential for academic – community partnership efforts (Cargo & Mercer, 2008; Israel et al., 1998). The challenge of lack of trust between academic researchers and marginalized,

underserved, and vulnerable populations is identified strongly within community based participatory research (CBPR) initiatives (Wallerstein et al., 2008). In the present study, we found the prior experiences of the academic partners with American Indian communities helped to build a trusting relationship with the Navajo Nation and the host organization. In addition, having an extensive formative research phase and community engagement process also fostered mutual understanding and trusting relationship within the partnership (see Chapter 4). Furthermore, the academic partners' commitment to program sustainability and long term collaboration was conducive to the development and maintenance of mutual trust necessary for collaborative implementation.

Capacity development is essential for academic – community partnership efforts (Israel, et al. 2005), and building and maintaining an adequate level of capacity is critical to ensure effective implementation (Meyers et al., 2012a; Wandersman et al., 2008). Capacity development is consistent with the principles of CBPR (Israel et al. 1998) and cultural values and traditions of American Indians (Chino & DeBruyn, 2006). Flaspohler, Duffy, Wandersman, Stillman, & Maras (2008) emphasized the need for two types of capacity development for quality implementation: innovation-specific capacity and general capacity that enables the organization to function better in a number of its activities. In this study, we found that the academic- community partnership valued the importance of capacity development “as much as the program was implemented”. Trainings were provided by the academic partners to develop general capacity of the host organization in addition to implementation-specific trainings.

The presence of program champions has been long recognized as important to foster internal support and buy-in (Durlak & DuPre, 2008; Fixsen et al., 2005; Greenhalgh et al., 2004; Sandler et al., 2005; Stith et al., 2006). In this study, we found a program champion was identified early on, who played an important role in garnering support for the program within the host organization and promoting the program to other partners, as well as inspired and led intervention staff to implement the program. However, the departure of the program champion at an early stage of implementation affect the potential for cultivating unified support for implementation within the host organization (Goodman & Steckler, 1989). Moreover, we found that the implementation effort was facilitated by a local field coordinator, who was familiar with the local culture and practices and had prior working experiences with both the academic partners and the host organization on other research projects. Rycroft-Malone et al (2013) emphasize the need for appropriate facilitation by individuals with the appropriate roles, skills and knowledge to enhance the process of implementation. The type of facilitation and the role and skill of the facilitator that is required is determined by the “readiness” of individuals, team and context for implementation (Kitson et al., 2008).

Finding time for non-academic partners to support research and intervention activities while delivering services and programs was challenging (Cargo & Mercer, 2008). However, effective implementation requires adequate allocation of personnel and time (Fixsen et al., 2005; Greenhalgh et al., 2005). In this study, we found that it was difficult for existing staff of the host organization to implement the NHS program without compromising the intensity of intervention implementation. Academic -

community partnerships should find a way to assure adequate allocation of resources (time, staff, funding, cooperation) and bring about necessary organizational changes prior to the onset of implementation (Fixsen et al., 2005). In this study, we found differing data collection and reporting requirements also presented a challenge for the academic-community partnership. Changers & Azrin (2013) suggest creating a single data infrastructure that is useful for both research and practice.

The importance of fostering stakeholders' buy-in and building a supportive organizational climate for effective implementation is well documented (Durlak & DuPre, 2008; Fixsen et al., 2005; Greenhalgh et al., 2005; Stith et al., 2006; Wandersman et al. 2008). As has been found in prior research, we found that buy-in of supervisors fell short due to a lack of their early involvement in the development and planning of the NHS program, failure to make connections with existing program objectives, and ineffective communication (Fixsen et al., 2005). Meyers et al (2012b) emphasized the need for communicating the perceived need for and perceived benefit of the innovation within the organization and for creating practices and policies that provide opportunities for stakeholder participation, foster shared decision making, enhance accountability and effective communication. Furthermore, use of academic language is a widely recognized barrier to effective communication between community and academic partners (Mitton, 2007). Hicks et al (2012) argued the importance of 'the language of community benefit' - translating the research and its goals to connect with community benefit- and the need to tell 'the whole story behind what we are doing' for stakeholder buy-in.

It is important to have a clear implementation plan and to outline the roles, processes, and responsibilities of implementation team members (Meyers et al., 2012a). In this study, we found that frequent manager turnover and a lack of clarity in their roles and responsibilities in the program weakened oversight and coordination of implementation. Organizational change and development is necessary for effective implementation of evidence-based programs (Fixsen et al., 2005). Our findings support this by showing how implementation was affected by inadequate planning and support for intervention staff (such as modification to job description, reporting and reimbursement requirements, and coordination from other partners) and resource allocation.

There are limitations to this study. First, the generalizability of findings from the present study is limited because this study was conducted only on the Navajo Nation and the particular context in which the implementation partnership occurred. However, many of our findings are consistent with findings in the literature, and most likely be applicable to the formation of other academic – community partnerships designed to translate public health intervention trials to sustainable, community implemented programs. Another important limitation is that we could not determine the relationship between different factors identified in this study and their relative contribution to the outcomes of the implementation effort.

This study has several strengths. First, this study was an integral part of the implementation partnership effort to learn factors that may have affected the partnership and implementation process and to inform future implementation efforts. Face-to-face

individual interviews were conducted at the end of the first round of implementation by the first author, who was not directly involved in the implementation process, and created open avenues for constructive feedback from stakeholders in the host organization on the academic – community partnership and implementation process. The credibility of this study also increased as the preliminary findings from these interviews were presented to the host organization and included in a project report to the host organization.

Additionally, as noted above, we applied qualitative interviewing methods to understand factors that facilitated or hinder the partnership implementation process from multiple stakeholder perspectives.

In summary, this study described important factors that facilitated or hindered the academic - community partnership for the NHS program and contributes to the growing literature of partnership approaches to translate effective interventions to sustainable, community implemented programs. The findings have important implications for research and practice. As with other academic – community partnerships for research, collaborative partnerships for implementation research need to build on mutual trust and respect between academic – community partners, and need to engage and obtain full support from critical stakeholders. Academic partners should show commitment to program sustainability and be responsive to community partners' interests in capacity development beyond implementation of a particular program. Community partners should proactively foster supportive organizational climate and program champions, and initiate necessary organizational change process to support front line practitioners and minimize foreseeable barriers to implement the program. Academic and community

partners should recognize the importance of having a clear implementation plan and engaging critical stakeholders and other agencies as part of the implementation team. Field facilitation and additional trainings should be provided to ensure the quality of implementation by local interventionists. Further research is needed to understand the relationship between different factors identified in this study and their relative contribution to the outcomes of the implementation effort.

CHAPTER 6: THE PERSPECTIVES OF LOCAL HEALTH STAFF AND STORE OWNERS ON IMPLEMENTATION OF A STORE-BASED NUTRITION INTERVENTION (PAPER 3)

Target journal: Health Promotion Practice

6.1 ABSTRACT

The Navajo Healthy Stores (NHS) program was a food store intervention to increase the availability, purchase and consumption of healthy foods on the Navajo Nation. The overall NHS intervention approach was a locally implemented and sustained intervention that was carried out by NSDP nutritionists/health workers. The purpose of this paper was to understand the community implementation of the NHS program from the perspectives of local health staff and food store owners/ managers. A qualitative study was conducted using semi-structured interviews with store owners/managers and local health staff and program document review. We found local health staff was able to recruit and work with store owners/managers to implement the intervention, but there were challenges in delivering educational sessions with adequate intensity and having store owners to stock healthier options. Key challenges for small stores to stock healthy foods included lack of customer demand, lack of availability and increased cost of healthy foods from suppliers due to long transportation route. Additional efforts should be undertaken to incorporate food store interventions into existing community health promotion activities and find innovative solutions to address both demand- and supply-side of healthy foods on the Navajo Nation.

6.2 INTRODUCTION

Small-store intervention trials demonstrates consistent improvement in the availability and sale of healthy foods, consumer knowledge, and the purchase and consumption of those foods (Gittelsohn et al., 2012b). While promising, working with existing small neighborhood stores faces many challenges that may vary from store to store, community to community, rural area to urban area (Flournoy & Treuhaft, 2005; Gittelsohn & Sharma, 2009). Storeowners' views on the opportunities and barriers for increasing healthy food supply are critical to develop effective intervention strategies (Flournoy & Treuhaft, 2005; Gittelsohn et al., 2006, 2010b; Larson et al., 2013; Public Health Law & Policy, 2009; Song et al., 2012). Furthermore, store owners can provide important insights about implementation successes and challenges that are crucial for successful outcomes and program sustainability (Adams et al., 2012; Dannefer et al., 2012; Gardiner et al., 2013; Gittelsohn et al., 2012a; O'Loughlin et al., 1996; Rosecrans et al., 2008; Song et al., 2011). The success of interventions focusing on changing the food store environment depends largely on engaging store owners/managers. Effective communication and skillful coordination between program staff and store owners are essential for engaging store owners and sustaining their participation (Gardiner et al., 2013; Song et al., 2011).

As food store interventions advance from feasibility trials to community implementation, there is a need to understand implementation successes and challenges from program staff and store owners' perspectives to help identify particular strengths and weaknesses that occurred during implementation and guide future program

development and implementation efforts. This paper sought to understand challenges in community implementation of a food store-based nutrition program from the perspectives of local health staff and food store owners/ managers. Specifically, we conducted semi-structured interviews with local health staff and food store owners/managers and document review to address the following research questions. (1) What were the challenges faced by local health staff in recruiting food stores and working with store owners? (2) What were the challenges faced by store owners in participating in the program? (3) What were storeowners' perceptions about the program, its implementation by local health staff, and program effectiveness?

6.3 METHODS

6.3.1 Study Setting

The Navajo Nation is the largest reservation in the U.S., covering the corners of three states: Arizona, New Mexico, and Utah. Most of the Navajo Nation is extremely remote and rural, and lack of infrastructure (e.g., electricity, paved roads, telecommunication, and transportation) (NDOH, 2004). The US Department of Agriculture Food Desert Locator shows that nearly the entire Navajo Nation is a food desert (USDA, 2012). There are only 9 supermarkets on the reservation in the small towns where a shopping center is located. There are also several trading posts and a few flea markets that sell limited food items. Across the reservation, there are many food vendors that sell a variety of prepared foods, such as fry bread, blue corn bread, piki bread, tamales, Navajo tortillas, corn meal, Indian tacos, hamburgers, pinon nuts, and soft drinks, among others.

The Navajo Healthy Stores program

The Navajo Healthy Stores (NHS) program was a food store intervention to improve dietary patterns on the Navajo Nation and to reduce risk for obesity by increasing the availability, purchase and consumption of healthy foods. The design of the NHS intervention was based on a previously intervention trial (Apache Healthy Stores, Curran et al., 2005; Vastine et al., 2005), and involved extensive formative research and a community engagement process (see Chapter 3 for more details). The intervention consisted of six phases, with each phase focusing on different foods and behaviors for promotion. The themes of six phases were (1) healthy beverages and breads, (2) healthy cooking methods, (3) healthier luncheon meat/eat in moderation (4) better healthier meals, (5) healthier snacks and desserts, and (6) planning ahead/ healthy and affordable meals.

The NHS intervention attempted to address both supply- and demand- sides of healthy foods. Three main components of the intervention included stocking healthier alternatives (low in fat/sugar, high in fiber), in-store and mass media communication, and interactive educational sessions (cooking demonstrations and taste tests). A list of healthier alternatives for commonly consumed foods was developed and divided into two categories: ‘all possible’ and ‘minimum standards’ promoted foods. The ‘all possible’ category included all foods that the NHS program hoped the participating stores would stock during each phase. The ‘minimum standard’ category included the foods required for the stores to stock within a phase. In-store intervention materials (shelf labels, posters, educational displays, flyers, recipe cards) and mass media strategies (the publication of

newspaper articles and the broadcast of radio announcements) were used to promote the program and communicate key behavioral messages each phase. In-store cooking demonstrations and taste tests were used to highlight the promoted foods and cooking methods for each phase and to engage customers.

During the formative research phase, food stores were identified across the Navajo Nation and availability of healthy foods was documented using a food source survey. The Navajo Nation was divided into 10 store regions on the basis of the presence of a supermarket. The 10 store regions were randomized into intervention (Round 1 implementation) and comparison (Round 2 implementation) areas. The intervention areas included 5 supermarkets and 10 smaller stores nearby the 5 supermarkets. The corporate management of the Bashas' supermarket chain established a memorandum of understanding with the university team and permitted its individual stores on the Navajo Nation to participate in the project. Top management of the chain convenience stores was contacted by interventionists when corporate approval was needed for participation of individual stores. In each region, the main grocery store and a few smaller stores housed the intervention.

The intervention was implemented by trained nutritionists/health staff of Navajo Special Diabetes Project (NSDP), a community health organization funded under the Special Diabetes Program for Indians (SDPI) (Community-directed) Grant Program for diabetes prevention and treatment services. Johns Hopkins University provided intervention materials, giveaways, periodic additional trainings and oversight. Each interventionist was assigned 1–2 stores and conducted a 1–2-h interactive session at each

store 2–4 times during each phase lasting 6-10 weeks. The interactive sessions included demonstrating healthier cooking methods, taste testing healthy foods, giving away promotional items, and responding to questions from store customers. The interventionists' additional duties were to create and maintain relationships with food stores, work with stores to stock key promoted healthier foods, and set up media materials such as educational displays, posters, and shelf labels. Radio announcements of key messages were recorded and played regularly in both Navajo and English (Gittelsohn et al., 2013).

6.3.2 Participants and Procedures

Study participants were NHS local interventionists (10) and program manager (1) and intervention store owners or managers (13). At the time when this study was conducted, of 15 stores recruited for the NHS program, one store was closed for business. The manager of a chain convenience store owned by a private company was not given permission to participate in the interview by their top manager. A total of 21 people were interviewed at their workplaces. Signed consent was obtained from all participants. A semi-structured interview guide was used to ensure that key areas were addressed in the limited time available to the participants. Topics covered included: store recruitment, intervention implementation, barriers to implementation, coordination with interventionists, program impact on customers and stores.

There was no audio-recording of interviews, out of respect for local culture and participants' preferences. The researcher wrote down interview responses, and made every effort to capture actual phrases and sentences used by participants. The duration of

interviews ranged from 10 minutes to 1 hour 45 minutes, but most of the interviews with store managers lasted 15 – 20 minutes and with interventionists lasted about 1 hour. Interviews took place during the last phase of the NHS program, from March 25 to May 15, 2009.

Program documents were reviewed to understand the experiences and perceptions of study participants in the program context, and to corroborate information from interviews, as well as to provide background detail for the study. These documents included program meeting and teleconference minutes, formative research reports, the interventionist manual of procedures, progress updates and reports, and journal articles.

This study was approved by both the Johns Hopkins University Institutional Review Board (IRB) and the Navajo Nation Human Research Review Board (NNHRRB).

6.3.3 Data Analysis

The template approach (Crabtree & Miller, 1999; King, 1998) was used to analyze textual data (from interviews and documents). A list of pre-determined codes derived from the literature, interview guide, and initial reading of interview responses and program documents were used to analyze the data and modified through careful reading and rereading of the data. A research assistant with a qualitative data analysis background helped check the accuracy and clarity of the coding template by independently coding a subset of data. Coded segments of text were entered into the appropriate data charts created for each code in the final version of the coding template using NVIVO 8.

Themes that were of direct relevance to the main research questions and of great importance to participants were prioritized, and representative, contextually rich quotes were identified to aid the understanding of specific points of interpretation.

6.4 RESULTS

Findings that described store recruitment and relationship building between local health staff (interventionists) and store owners/managers are presented first, followed by a description of challenges in implementing the food store – based intervention by comparing and contrasting between storeowner/manager and interventionist accounts, and lastly a description of storeowners’ perceptions about the program, its implementation and effectiveness.

6.4.1 Store Recruitment and Relationship Building

There were concerns and trust issues in recruiting stores for the program. Interventionists reported they felt uncertain about approaching food stores managers initially about the healthy stores program. As an interventionist described,

“I guess my concern was the store managers, owners, whether they accept the program or not. We’re just stepping on their toes. I thought that might be a conflict. We’re trying to promote healthy foods but they might worry about getting rid of unhealthy snacks that they’re making the most money of.” (Interventionist, I1)

In fact, this concern did not appear to be an issue for most of the store managers that participated in the program. Most of the store managers expressed that they

welcomed interventionists because they felt the healthy stores program would be beneficial to their customers and community in combating diabetes. They acknowledged that a lot of Navajo people have diabetes and that diabetes has affected their families and employees. Two of the store managers, who had shown great support for the program according to the interventionists, emphasized the importance of having the program based on their experiences and knowledge about diet and health.

“I knew about diabetes ten years back, and how diabetes affected Navajo people. When (the interventionist) came, I didn’t think twice. Eating healthy, it saves your life. ... All my employees have or know someone who had diabetes (that) either took their lives or took their limbs. When the program came, no issue involved.”
(Supermarket manager, S12)

“I got family members who had cancer, diabetes, and their doctors told (me) about it (healthy eating). ... Twenty percent of Navajo have diabetes, that’s one in five people. They don’t realize picking up soda that’s slowly killing ourselves. A lot of people are getting social security, significant amount of food stamps and compensating on junk foods. They line up for pop, juice and candy. ... People here drink a lot of energy drinks. It would be good to show customers the down side of it, how our body reacts to it.” (Convenience store manager, S4)

However, according to the program manager, who was in charge of store recruitment, some convenience store managers were hesitated to participate in the program because of “*lack of trust*” and “*worried about losing customer money.*” The

program manager also reported challenges in convincing the top manager of a convenience store chain owned by a private company that had over 40 stores throughout the Navajo Nation. He remarked, *“District managers were very willing to meet with them (interventionists). They wanted to participate and increase local availability of healthy foods. But CEO very hesitated”*.

Communication between interventionists and store managers also presented a challenge when the program was introduced. A supermarket manager reported interventionists failed to introduce themselves as part of the program,

“I didn’t know people came to the store first time. They didn’t introduce themselves as part of the program. I asked who they were. People came up before, set up tables and targeted on healthy items.” (Supermarket manager, S11)

One of the interventionists who worked with that supermarket remarked,

“We went to the store, talked to the store managers, told them how we would do (the program), putting up posters, low fat low sugar shelf labels. They felt that they didn’t know what we’re talking about ... until we told them the memo (the Memorandum of Understanding between the university and the supermarket corporate office).” (Interventionist, I9)

Other interventionists also remarked on the importance of having a memo or a written confirmation from the top managers of chain stores to show to store managers. An interventionist (I4) said, *“If you just step in there, they don’t remember who you are.”* This seemed to be particularly true when stores had several managers.

Despite these initial challenges, interventionists reported they were able to establish good relationships with most of the store managers during implementation. As an interventionist remarked,

“We established good relationships with them but not getting in their way, although you know talking with them about what we needed to make available to customers, especially small convenience stores it’s kind of hard.” (Interventionist, I5)

This remark seemed to reflect a difficult situation of interventionists attempting to have store managers stock promoted healthier options for the program while keeping good relationships with them. A convenience store manager (S3) remarked, *“They (interventionists) had something on shelves, put healthy labels. They never told me don’t sell this or order this.”* Most of the store managers felt the program ran smoothly, and commended interventionists as friendly, nice, easy to have, and very organized. Interventionists reported some store managers were very supportive, providing help to set up tables and donating foods for cooking demonstration.

6.4.2 Implementation Challenges

Challenges in implementation are presented below by program components: interactive educational sessions (cooking demonstrations and taste testing with customers) and stocking healthier options.

(1) Challenges in setting up educational sessions

A key challenge faced by interventionists in increasing demand for healthy foods through point-of-purchase educational sessions was setting up educational booths where promoted foods were located and when many customers presented in stores.

Interventionists reported some stores had little space and narrow aisles, and they were allowed to set up an educational booth only in a designated area in these stores. Store managers of several smaller stores mentioned having interventionists on a busy day was a little inconvenient. As a convenience store owner (S5) said, *“The only negative I’d think of was the space taking up on a busy day.”* An interventionist (I4) reported, *“The store manager told me, it’s a busy day why don’t you come up these days”*. Store managers’ preference for having interventionists on a not so busy day appeared to be at odds with interventionists’ tendency to visit stores on a busy day (i.e., the first of the month) when they could educate many customers. As another convenience store manager (S7) remarked,

“Only thing I kind of see this and I don’t know if anything changes like that, sometime when she came here, there were many customers here. But I don’t know if she or I can change when customers come...To me she came when we’re very busy. Sometimes I felt bad. We’re busy when she could teach a lot of people. ... Sometimes we didn’t have a lot of customers for her to educate.” (Convenience store manager, S7)

(2) Challenges in stocking healthier options

Only about one third of store managers reported adding some healthier snacks or healthier drinks that they had not previously stocked. A convenience store manager reported not stocking any additional healthier options for the program, because his store already carried a lot of healthy foods based on the WIC requirements. According to interventionists, requesting managers of smaller stores to stock promoted food items, i.e., fresh produce, was challenging, and stocking of these items was inconsistent. An interventionist (I4) remarked, *“(A convenience store manager) said focusing on fresh produce, may be like 88% of that could goes to waste. They would loose money, so they hardly put them on shelves.”* Store managers expressed two key concerns about stocking healthier options that they had not previously stocked. One of the concerns related to customer receptivity and demand for healthier options. As two store managers commented,

“It’s not good (for the business) if it’s healthy but people don’t buy. ... It’s difficult to get people try new things, often people are reluctant to try new foods. Some incentives might encourage that change.” (Convenience store owner, S 5)

“The chapter (similar to towns, the smallest administrative units on the Navajo Nation) asked us to put more healthy stuff, but they’re still buying all that unhealthy stuff. ... If you look at Navajo people, compared to Flagstaff they are more obese than some other towns, not just Flagstaff. I don’t know it’s because we sell unhealthy foods. They know there’re other choices. People (from health

department) come out and set booths and educate them healthy options.”

(Convenience store manager, S13)

Some store managers attributed the perceived and actual cost of healthier choices to low customer demand for healthy foods. A supermarket manager expressed that healthy foods are expensive for a lot of local people,

“Especially the way economy it is today, things get expensive. People don’t have enough money to eat healthy. I can’t do it myself sometimes. A lot of times foods less healthy less expensive; healthy foods are a lot expensive. A lot of people can’t afford it.” (Supermarket manager, S8)

The other key concern store managers had was the availability of healthier options from suppliers and cost of stocking healthier options, which might relate to inconsistent stocking of promoted food items observed by interventionists. As a convenience store manager remarked on the challenges of obtaining and transporting healthier options from suppliers,

“(The main concerns I had were) our ability to order those food items and the cost of the food items. The food items come from Albuquerque or Texas headquarters, and it goes through Cuba and comes here. This process could make a \$1.99 item reach \$4.50. So price and availability were the biggest thing I have run into. ... The bread we ended up having it ourselves, driving our own car in town. Water was \$1.39 or \$1.29, but it came down to 0.59 cents that way. But perishable items we couldn’t haul back.” (Convenience store manager, S4)

In addition, one of the convenience store managers commented on the changes to increase fresh produce in the 2009 new WIC food package. He was concerned about meeting minimum inventory requirements, keeping fresh produce refrigerated and transporting from a distance. His concern might reflect barriers for other small stores in stocking additional fresh produce promoted by the healthy stores program.

6.4.3 Store Owners/Managers' Perceptions

The following section presents store owners/managers' perceptions about the Navajo Healthy Stores program, its implementation by local health staff, and program effectiveness.

(1) Perceptions about the program

Store managers consistently perceived the program as an educational program on healthy eating that targeted their customers. A supermarket manager (S11) felt the program was *“just like every other program (done by the Navajo Health Department), giving information (to customers).”* Some store managers commented positively on the intervention materials (i.e., shelf labels, flyers), citing that helped their customers make healthy choices. A convenience store manager (S1) remarked on the potential impact of shelf labels on her store, *“If they (customers) don't see it (shelf labels), (they would say) ‘oh, they don't have any healthy choices here’.”*

Most of the store managers perceived the program was neither good nor bad for their business. A store owner remarked,

“(The program was) simply making them (customers) aware of the benefits of selecting healthier items instead of unhealthy items. That knowledge allowed them to make simple choices like that. ... (It had) no negative impact on my business ... actually it’s kind of a positive thing happened ... something different probably some extra interests (to customers), anything out of ordinary is interesting here.”
(Convenience store owner, S5)

A supermarket manager expressed that the program helped his store by increasing sales of sampled foods by interventionists,

“We sold the products sampled and all ingredients whatever she used to make it on the table. We saw a rising sale on the aisles she did sampling afterward. We hit people at the time she was here, but not people who came later because they’re not the same people. It helped us.” (Supermarket manager, S12)

Some store managers mentioned that they and their employees had also benefited from the program personally in terms of improving their knowledge about healthy eating.

“I realized after they set up booth (and) educated them diet Pepsi was better than regular one, one of my staff started taking diet pepsi rather than regular one.”(Convenience store manager, S 10)

(2) Perceptions about intervention implementation by local health staff

In general, store managers perceived that the interventionists from the NSDP did a good job of implementing the program. They felt customers (as well as themselves)

liked and learned from the educational sessions. A store manager expressed his positive feeling about the educational sessions provided by interventionists as part of the NSDP,

“The training was great, not just good. If we could hit one person we accomplish our job. If we hit more people, that’s good. I like the Special Diabetes Program, I always do. ... The program in itself, especially in last few years it’s a great tool for our people to have, to reduce what makes people have diabetes and death. You don’t realize how much diabetes hurt until you see it yourself. That needs more training. I like the cooking demonstrations myself.” (Supermarket manager, S12)

However, store managers also perceived that only some of their customers were interested in the educational sessions. As a convenience store manager (S4) remarked, *“People came and I told them go talk to this lady. Some listened; the rest just waved their hands back to the door again.”* Some store managers felt their customers were shy about participating in educational sessions.

It was also commonly perceived by store managers that educational sessions happened sporadically in their stores. Most of them expressed they would like interventionists to continue the work and do it more often in their stores to persuade many customers to change their behavior. As a store manager remarked,

“I think they need to do it more often, so the word would be out. The more you spell it, the more it gets out... people will start listening. Do it more often, not just once every 3 or 4 months.” (Convenience store manager, S13)

Some store managers felt that interventionists were overloaded, and it would take more people to do it often. A supermarket manager remarked,

“I think the nutritionist was overloaded. She was running around. She was all over the reservation from here to other parts of the reservation and came back here again.” (Supermarket manager, S12)

There were a few complaints about the use of intervention materials by interventionists. A supermarket manager reported their store did not receive the big ‘healthy store’ banner that was presented in other participating supermarkets as being part of the healthy stores program, and the posters on the windows became worn. A convenience store manager remarked that the interventionists did not provide enough information about shelf labels and flyers that would have helped to inform their customers about healthy options they had. Another store manager expressed her dissatisfaction with the use of pamphlets with older illiterate customers,

“A lot of times they had their pamphlets. You know many grandparents are not educated, give them pamphlets they can’t read. I haven’t seen anyone teaching eating healthy... Grandparents have radios, inform them that way or they can tell them if they’re going to do sampling. They can tell them in store, present to them, show to them here the place where they pick (the healthy options).” (Supermarket manager, S8, discontinued the program halfway)

(3) Perceptions about program effectiveness

Most of the store managers perceived that some of their customers started buying healthier items that were low in sugar or fat after the healthy stores program started. A convenience store manager described a slight shift in customer purchasing behavior because of the program,

“I saw people stand there, looked at spam, soda. Now they look at apples, fruits and vegetables. ...I see sales go up for water, cooking spray and whole wheat bread, and light spam.” (Convenience store manager, S4)

Some store managers perceived that the program had no obvious impact on their customers. A convenience store manager remarked that the program had little impact because it only reached small numbers of customers that shopped at her store. Another convenience store owner expressed that he was not sure how the program was effective because *“it’s difficult to measure”* and *“hard to quantify the results.”*

6.5 DISCUSSION

This is one of the first studies to examine the implementation of a food store-based nutrition program from the perspectives of both local health staff and store owners/managers. The findings presented in this paper provide key insight into community implementation of food store-based nutrition programs to improve diet quality in underserved communities.

As has been found in prior research, we found that store owners participated in the program because they perceived the program as beneficial to their customers and

community (Song et al., 2011). Most of the store owners explicitly expressed how diabetes has affected their families, employees, and community, and felt the program could help compact diabetes. Our findings also indicate that store owners are more likely to support the program if they have more knowledge about the relationship between diet and health. Thus, nutrition education training to help store owners understand the importance of stocking of healthy foods should consider including information on the relationships between diet and health, particularly diet-related health problems (e.g., diabetes) that affect their community(Song et al., 2011).

The findings suggest the importance of having a written agreement from the top managers of chain stores. Chain food stores often make centralized decisions about product selection, price, promotion, as well as nutrition related activities, and have centralized supply and distribution of products (Hawkes, 2008). All four Bashas' store managers referred to the approval of their corporate office as the main reason for their participation in the program. Most of the store managers of convenience store chains needed permission from their top managers to participate in the program. From the local health staff's perspective, having written confirmation from the top not only helped recruit stores, but also helped inform store managers when they were present in the stores to do intervention activities (at least initially).

Store managers commonly perceived the program as an educational program on healthy eating, but not as a food environment change intervention. There are several plausible explanations for this. First, there was a lack of involvement of store owners/managers in the design and planning stage of the program. Although store

managers across the Navajo Nation were invited to intervention development and planning workshops through community flyers and local health organization newsletters, only five store managers (all from supermarkets) participated in these workshops. And because of randomization of stores to intervention and comparison areas, only one of those five stores was assigned to the intervention. It would have been better if store managers were involved in the program in the beginning to understand the goals, intervention approaches, implementation standards, as well as evaluation methods for the program. Also, store owners/managers' input at this stage is crucial to develop effective intervention and implementation strategies (Gittelsohn et al., 2006, 2010b; Song et al., 2012). Second, local health staff (as interventionists) focused implementation on educational sessions with store customers, as discussed more detail below. Third, no intervention strategy targeted store owners/managers. Prior research suggests the potential of intervention strategies, such as monetary incentives, nutrition education training, business training (e.g., stocking and handling fresh produce) for store owners to help ensure stocking of healthy foods in small stores (Gittelsohn et al., 2012b; Song et al., 2011).

Local health staff reported the stocking of promoted foods was challenging and inconsistent, a finding also reported in other studies in AI/AN and remote rural settings (Curran et al., 2005; Gardiner et al., 2013; Rosecrans et al., 2008). Only about one third of store managers reported adding some healthier snacks or healthier drinks that they had not previously stocked. All but one of these stores reporting adding healthier items were smaller stores, which may reflect the fact that the four participating supermarkets already

had high availability of promoted foods. Our observational data also indicate no significant improvement in stocking of healthy foods in those smaller stores post intervention (Unpublished data). Small store managers reported lack of customer demand, lack of availability and increased cost of healthy foods from suppliers due to long transportation routes, as key challenges for stocking healthy foods. The economic recession that began in late 2008 and continued into 2009 may also have influenced customer demand for healthy foods (Bezruchka, 2009), as suggested by a supermarket manager in our study. Small stores located in remote rural areas face unique challenges in stocking perishable items like fruits and vegetables due to the time and costs associated with long transportation route (Bailey, 2010; Gittelsohn et al., 2006; Hudson, 2010; Mead, Gittelsohn, Kratzmann, Roache, & Sharma, 2010; Rosecrans et al., 2008). Gleason, Mogan, Bell, & Pooler (2011) reported difficulties faced by small stores in remote rural areas in obtaining the new WIC foods because suppliers refused to deliver them due to their remote location, or the foods when delivered were often near expiration. Emerging studies on implementation of the 2009 new WIC package suggest that small stores are able to adjust and adapt to the addition of healthy foods to their inventory (Andreyeva, Middleton, Long, Luedicke, & Schwartz, 2011; Gleason et al., 2011; Gittelsohn et al., 2012a). Most of the small stores in our study were WIC authorized vendors. It would have been interesting to learn how these stores responded to the changes. Lessons learned from these studies can inform small stores on the Navajo Nation to increase availability of healthy foods. Innovative strategies that fit the local context, for example, a Farm-to-

Table program connecting local farmers to small grocers may help address barriers associated with distance and cost of stocking perishable items (Setälä et al., 2011).

Local health staff can play an important role in increasing community demand for healthy foods and facilitating stocking of healthy foods in small stores. Our findings suggest, however, there are limitations in utilizing local health staff as interventionists. First, local health staff have full schedules with their regular duties and effort beyond that is difficult (see Chapter 5). Store managers reported in-store educational sessions happened sporadically, and felt local health staff needed to do more to persuade customers to change their behavior. Moreover, local health staff (mostly nutritionists) viewed their role in the program as nutrition educators to provide education for customers. This is primarily because the work related to the program was inclusive in their performance standard to get credit for their job (see Chapter 4). Another reason for local health staff to focus on nutrition education is their concern about “stepping on shoes” of store owners. Our findings indicate a difficult situation for local health staff attempting to have store managers stock promoted healthier options for the program while keeping good relationships with them. In addition, the lack of focus on stocking of healthy foods also attributes to limited oversight of implementation due to manager turnover and insufficient time for regular monitoring and feedback from program staff (see Chapter 4 and Chapter 5). Other food store-based programs suggest that close monitoring and timely feedback can improve program implementation (Curran et al., 2005). Still, having local health staff as interventionists is preferred from a sustainability perspective. As our evidence indicates, having local health staff as interventionists can

enhance local buy-in. They are well known by community members (some local health staff were already familiar with participating store managers prior to implementation) through their regular job and already established credibility for their work. Store managers expressed positive feeling about the educational sessions provided by the local staff as part of the Special Diabetes Program. The lessons learned during the present study should be addressed in future community implementation efforts.

This study has several limitations. While we sought to understand the implementation of the NHS program from the perspectives of local health staff and store owners/managers, we did not interview community members/store customers. Ultimately, community members are the end users of the program, and their perceptions about (and experience with) the program are crucial for the success of the program. Additionally, due to resource and time constraints, we did not collect observational data regarding how the intervention was executed. This data would provide us information about other important aspects of implementation, such as quality, fidelity, dose, and reach of intervention implementation. The generalizability of findings from the present study is limited due to a relatively small numbers of stores participating in the study and the particular physical, social, and economic environments of the Navajo Nation where the participating stores are located.

In conclusion, local health staff were able to recruit and work together with store owners/managers to implement the NHS program, but there were challenges in delivering educational sessions with adequate intensity and having store owners stock healthier options. Our findings have important implications for future development and

implementation of food store-based nutrition programs in rural American Indian contexts. Future food store-based nutrition programs should pay attention to improving store owners/managers' knowledge about the relationships between diet and health and actively engaging them in the design and planning of intervention approaches, implementation standards, as well as evaluation for the program. Local health staff can play an important role in implementing and sustaining food store-based nutrition programs. Additional efforts should be undertaken to incorporate food store intervention into existing health promotion activities and find innovative solutions to address both demand- and supply-side of healthy foods on the Navajo Nation.

CHAPTER 7: CONCLUSION

This chapter will summarize the key findings of the dissertation research, discuss the strengths and limitations of the study, and make recommendations for future research, policy and practice.

7.1 SUMMARY OF FINDINGS

The first paper describes the process and strategies used by the collaborative partnership between Johns Hopkins University Center for Human Nutrition and Navajo Special Diabetes Program to implement and sustain the Navajo Healthy Stores (NHS) program. Our findings indicate that the academic-community partnership for implementation of the NHS program evolved through an engagement, formalization, mobilization, and maintenance process, but there were important challenges needed to address in order to successfully move through the stages of implementation. This paper demonstrates that the use of a combination of different theories or theoretical constructs can enhance the understanding of the complex process of implementation and partnership development in a more systematic way, and help identify challenges needed to address.

The second paper examines the academic – community partners’ experiences with the NHS program and identifies key factors that have affected the implementation partnership. We identified four important facilitating factors and three key challenges for the implementation partnership. Facilitating factors include trust in the academic partners’ experience and commitment to sustainability, being responsive to the

community partner's interests in capacity development, having a program champion, and having a dedicated and experienced field coordinator. Challenges for the partnership include fitting into staff job schedule, obtaining buy-in from critical stakeholders, and overseeing implementation. The findings demonstrate that the successful translation of academic-derived intervention trials to sustainable, community implemented programs will need long-term commitment of academic – community implementation partnerships.

The third paper describes the implementation of the NHS program from the perspectives of local health staff (as interventionists) and store owners/managers, in terms of store recruitment, relationship building, and challenges in delivering the intervention. In addition, storeowners' perceptions about the program, its implementation by local health staff, and program effectiveness are described. We found that local health staff members were able to recruit small stores and maintain good relationships with store owners/managers, but there were challenges in delivering educational sessions with adequate intensity and having store owners stock healthier options. Small store managers reported lack of customer demand, lack of availability and increased cost of healthy foods from suppliers due to long transportation routed as key challenges for stocking healthy foods. Store managers commonly perceived the program as an educational program on healthy eating that targets their customers, expressed positive feelings about intervention implementation by local health staff as part of the Navajo Special Diabetes Program, but felt local health staff needed to do more to have significant effects on changing customers' behaviors. Additional efforts should be undertaken to incorporate the NHS intervention into existing community health promotion activities and find innovative

solutions to address both the demand- and supply-side of healthy foods on the Navajo Nation.

7.2 STRENGTHS AND LIMITATIONS

A strength of this study was the relevance and novelty of the topic under investigation. Previous research on the dissemination and implementation of evidence-based nutrition interventions in community settings focused on school-based interventions for general population, was primarily guided by diffusion theory and primarily used a top-down approach to dissemination and implementation (Ciliska et al., 2005; Rabin et al., 2009). This dissertation aimed to address these gaps in the literature by examining the implementation process of a store-based nutrition intervention on an AI reservation guided by the frameworks or models of participatory research and stages of implementation process.

Another strength of this study was the use of qualitative methods, which grounded the research in the local context and enabled access to experiences and perceptions of those directly involved in the program. This study also incorporated multiple stages of fieldwork over a 1.5-year period, including field visits during the development and initiation of the NHS program and the early phases of intervention implementation and in the end of the intervention implementation. Additionally, the use of multiple data sources, including program documents and interviews with key stakeholders allowed for triangulation of the data as well as understanding of the implementation from the perspectives of researchers, practitioners, and store owners.

There were limitations to this study. Because this study was conducted only on the Navajo Nation, the generalizability of findings to other settings is limited. Further, we could not determine the relationship between various factors identified in this study and their relative contribution to the outcomes of the implementation effort. While the researcher attempted to understand the partnership process and factors affecting the implementation of the NHS program from the perspectives of various stakeholders, she did not interview community members/store customers. Ultimately, community members are the end users of the program, and their perceptions about (and experience with) the program are crucial for its success. The NHS exposure data from store customers can provide additional information on the program implementation. Additionally, due to resource and time constraints, the researcher did not collect observational data regarding intervention execution. These data would provide us useful information about other important aspects of implementation, including the quality, fidelity, dose, and reach of the intervention implementation.

Another limitation of this study was that we did not audio-record the interviews, because of participants' preferences to remain completely anonymous, and because of time constraints to obtain the NNHRRB approval for audio-recording at the time this study was conducted. I wrote down interview responses with permission, and made every effort to capture actual words or sentences used by interviewees. For instances, when I was not able to get down fully what an interviewee said about something that seemed particularly important, he/she was politely asked to repeat it. Further, I quickly reviewed the written responses immediately following the interview, and asked interviewees for

clarification if I found something was missing or incomplete. In the earlier stage of the field work, the field coordinator helped check the completeness and accuracy of written responses taken immediately after an interview with her, and the results were very satisfactory. Prior to conducting this study, I worked in a similar (organizational and cultural) setting (San Carlos Apache Indian reservation) for six months. During this period, I had the opportunity to conduct many interviews with staff from the local Diabetes Prevention Program and direct observations of program related activities. These experiences allowed me to build skills for conducting qualitative interviews and writing down interviewee responses. Also, the prior field experience provided me well the opportunity to become familiar with American Indian culture and ways of communication. This, in turn, allowed me to be more culturally sensitive when interacting with local people and conducting interviews.

Moreover, the extent and duration of field work that I was involved in with the NHS program increased the credibility of this study. I visited the research site multiple times during the early phases (i.e., the development and planning) of the NHS program and was involved in many aspects of the program, including attending community workshops and program meetings, writing workshop reports and meeting minutes, analyzing formative research data, assisting the trainings of interventionists and capacity building, as well as sitting in on meetings, such as the IRB meetings. These experiences provided me the opportunity to become familiar with the program as a whole and the research setting, and to know as well as to be known by the people (key stakeholders) who were closely involved in the program. Building on the existing relationships and

trust, two key stakeholders were willing to provide extensive background information about the setting and it was extremely helpful for me to check against biases. Although I was not directly involved in the program, I was kept informed by the research team about its progress on a periodic basis. In fact, my disengagement during the intervention implementation and my primary role as an evaluator of the program served my neutrality and enhanced the frankness of responses in the course of the interviews with key stakeholders for this study. Additionally, the experience itself of traveling across the Navajo Nation to meet with key stakeholders (i.e., store owners) for the interviews helped my understanding of particular challenges faced by nutritionists and store owners in implementing the overall program in remote isolated communities.

Finally, the credibility of this study increased as this study was conducted as an integral part of the NHS program to inform future implementation efforts. This study created avenues for constructive feedback from stakeholders. The credibility of this study also increased as the preliminary findings of this study were shared with NSDP stakeholders and included in a project report (www.healthystores.org). The PI and field research coordinator, who were also participants in this study, peer reviewed the findings and these manuscripts.

7.3 IMPLICATIONS FOR THEORY

Our findings support the four stage partnership process proposed by Cargo & Mercer (2008) by naturally falling into the four consecutive stages: engagement, formalization, mobilization, and maintenance. The findings also indicates that an effective (or ineffective) participatory partnership process can facilitate (or hinder) the

host organization successfully moving through the stages of implementation. Our study identified key challenges as well as facilitating factors that affected the function of the participatory partnership, and has shown how these factors affected the outcomes of the implementation.

Moreover, we identified specific strategies used by the NHS partnership during the implementation process, many of which demonstrate the components in Meyers et al (2012a) Quality Implementation Framework (QIF). QIF was synthesized based on information from 25 implementation frameworks. The formative research and identification of a host organization found in this study can draw a parallel to the assessment step in QIF regarding the host setting, including organizational needs, innovation-organizational fit, and a capacity or readiness assessment. Adapting the intervention to fit the host setting is a critical step in the QIF and more specifically represented in this study as a planned adaptation through community workshops. Staff recruitment and pre-innovation training were accomplished in the NHS program through the collaboration between the research team and the host organization. The NHS program involved creating implementation teams and developing an implementation plan but in a less structured way. Indeed, there was a plan to create a Community Advisory Committee (CAC) to guide the implementation process and sustainability of the program. A number of people interested in being part of a CAC signed up during community workshops. But the original CAC plan was scrapped and focused on work with NSDP after a mutual agreement was reached between the research team and the host. This study also identified ongoing implementation support that consists of technical support, process evaluation,

and supportive feedback mechanism, similar to the third phase of the QIF. Building general capacity and obtaining explicit buy-in from critical stakeholders were included in the QIF as pre-innovation steps, but in the NHS program these two elements occurred primarily during the intervention implementation. This study identified feedback and sustainability as the last step in the implementation process. Feedback is similar to the concept of learning from experience in the QIF, and represented in this study as gaining insights into the host organization's experience with implementation and reporting back the results of the evaluation to the host organization.

7.4 IMPLICATIONS FOR PRACTICE

Academic – community partnerships can be a viable approach to translate academic-derived intervention trials to sustainable, community-operated programs (Wallerstein & Duran, 2010). This study identified the process and strategies used by an academic - community partnership to implement and sustain a food store-based intervention, as well as facilitating factors and key challenges for the implementation partnership. This information can guide academic researchers and community practitioners in developing effective partnerships for community implementation of evidence-based interventions and help navigate more effectively the complex process of translation and implementation.

Future efforts to implement evidence-based nutrition programs through academic – community collaboration in American Indian contexts should apply the principles of community-based participatory research (Chino & DeBruyn, 2006; Israel et al., 1998) to established mutual trust and respect and facilitate the partnership implementation process.

Academic partners should show commitment to program sustainability and be responsive to community partners' interests in capacity development beyond implementation of a particular program. Community partners should proactively foster supportive organizational climate and program champions, and initiate necessary organizational change process to support front line practitioners and minimize foreseeable barriers to implement the program. Academic and community partners should recognize the importance of having a clear implementation plan and engaging critical stakeholders and other agencies as part of the implementation team. Field facilitation and additional trainings should be provided to ensure the quality of implementation by local interventionists.

Future development and implementation of food store-based nutrition programs in rural American Indian contexts should consider bringing local health staff and food store owners together to ensure both the demand- and supply-sides issues related to healthy foods are addressed in a coordinated manner. Further, intervention strategies (such as monetary incentives, nutrition education training, business training) targeting store owners/managers should be developed to help ensure stocking of healthy foods. These strategies should include nutrition education components to increase store owners' knowledge about the relationships between diet and health (i.e., diet-related health problems, such as diabetes and obesity that affect their community). Local health staff can deliver these nutrition education components as part of existing health promotion activities. Moreover, food store-based nutrition programs should create an effective mechanism for continuous monitoring and evaluation to increase accountability, allow

for early identification of potential problems, and provide supportive feedback in a timely manner. Additional efforts should be undertaken to build trusting relationships between local health staff and store owners, and to actively engage store owners in the design and planning of intervention approaches, implementation standards, as well as evaluation for the program. Finally, future food store-based nutrition programs in rural American Indian contexts should find innovative solutions, such as a Farm-to-Table program connecting local farmers to small grocers to help address barriers associated with distance and cost of stocking perishable items.

7.5 IMPLICATIONS FOR POLICY

Given that nearly the entire Navajo Nation is a food desert (USDA, 2012) and challenges exist for stocking healthy foods in small food stores in this setting, policy initiatives initiated by tribal leadership are necessary to support long-term changes in food retail environment. Tribal leadership can model upon Healthier Food Retail (HFR) initiatives at state- or federal- level (CDC, 2011), or connect healthy food initiatives to tribal agricultural policies or other community development policies to create greater support for improving the food store environment. Local health practitioners and community health organizations, such as Navajo Special Diabetes Program can support initiation of such policy initiatives by sharing information about the NHS program, formative research and outcome evaluation findings, as well as their experiences working with store owners/managers, and help policy makers move toward greater support for expansion of the NHS program.

An important challenge for the academic – community partnership relates to funding, particularly inadequate research funding to continue the NHS program for a longer period and funding regulation or reimbursement policy regarding the use of existing organizational resources to cover the costs associated with implementation of the program. Thus, it is critical to develop funding policies for research and health promotion that are conducive to implementation and sustainability of evidence-based nutrition programs in community settings. Such funding policies should allow adequate resources for extra costs, effort, equipment, manuals, materials, recruiting, access to expertise, re-training for new organizational roles, associated with implementation (Fixsen et al., 2005), as well as continuity of funding for a longer period to ensure sustainability of the program in the community.

7.6 IMPLICATIONS FOR FUTURE RESEARCH AND METHODOLOGY

Study academic - community partnership approaches to implement and sustain food store-based interventions in other settings: this study serves as one case study conducted to understand the process and challenges of translating an academic-derived food store-based intervention trial into a sustainable, community-operated intervention. More studies are needed in other American Indian contexts and in other community contexts to add on information to this new area of study. Future studies can apply the process and strategies identified in this study to evaluate whether they are applicable to other food-store based programs in other settings.

Collect observational data on implementation and qualitative data from community members: without having data regarding how the intervention was executed, little can be evaluated with regard to other important aspects of implementation, such as quality, fidelity, dose, and reach of intervention implementation. The information can corroborate qualitative data on implementation, and any discrepancies warrant further examination. Future studies should collect qualitative data on store customers. Ultimately, community members are the end users of the program, and their perceptions about (and experience with) the program are crucial for the success of the program and understanding of the process and challenges of program implementation.

Expand formative research by exploring the formation of linkages and partnerships with local fresh produce suppliers and producers: small stores located in remote rural areas on the Navajo Nation face unique challenges in stocking perishable items like fruits and vegetables due to time and cost associated with long transportation route. Formative research could be used to identify and possibly provide a map of local food producers, and explore the potential for linking small stores with local fresh produce suppliers and producers. Additionally, future studies should also explore how WIC vendors on the Navajo Nation responded to the new WIC packages. This information is valuable to share with non WIC vendors and may encourage them to stock healthy foods.

Use planned adaptation and store-specific implementation plan: The implementation strategies for the NHS program included a planned adaptation of a previous intervention trial through community workshops prior to intervention delivery. Local health staff members who served as interventionists were actively involved in this

process. Planned adaptation can resolve the tension between the need for fidelity and adaptation (Lee, et al. 2008). However, the NHS program was not able to engage small store owners in the development and planning process. While there are common challenges to stocking healthy foods, stores are likely to differ with respect to concerns, capacity and barriers for stocking healthy foods. Future studies should work closely with stores to develop implementation plans that takes consideration the range of unique circumstances found by stores.

APPENDIX A-D

APPENDIX A: CONSENT FORM

Johns Hopkins University
Bloomberg School of Public Health

Title of Research Project

Expanding and sustaining a successful food-store based program to improve diet and reduce risk for obesity and other chronic diseases in American Indians: Local organization interviews (Form G) [phase 4].

Explanation of Research Project:

Hello, my name is _____, and I am an evaluator with the Healthy Stores Program. As you know, the main goal of the program is to prevent some of the common health problems in American Indian communities, like diabetes, obesity, heart disease, and hypertension. We are doing this by working with local stores and the Special Diabetes Program to help make sure healthy and affordable food choices are available to people here, that they know about their benefits and how to prepare them.

You have been chosen to participate in this research study because you are either a staff person or manager of the Special Diabetes Program, a manager or staff at one of the local stores on or near the Navajo Nation, or part of the Johns Hopkins research team -- and you have contributed in some way to the implementation of the Healthy Stores Program on the Navajo Nation. At the end of the first round of program implementation, we would like to interview you about your involvement and experience in the process of adopting and implementing the Healthy Stores Program and lessons learned and challenges encountered. We will use this information to help us improve planned future rounds of the program.

If you agree to participate in this study, we will do an interview with you as soon as is convenient for you. The interview will take about 60 minutes. If you are a manager/supervisor or intervention staff of the Special Diabetes Program, the interview will be followed by a brief questionnaire. The brief questionnaire will take about 5 minutes. The interview will not be audio recorded. We have tried our best to exclude any sensitive questions. However, if you feel that any of our questions are too sensitive, please do not hesitate to let me know, and I can either move to the next question or discontinue the interview.

Your participation is voluntary and if for any reason you wish to withdraw from the study, you may do so. You do not have to answer questions that may bother you. We will be taking notes during the interview, but this information will be kept confidential.

Your name will not be mentioned in any reports we prepare. The information will be kept in a locked file cabinet in the researcher's locked office. The researcher will be the only person with access to the data. The information will be kept for about two years, after which the paper forms will be destroyed.

There are minimal risks associated with participation in this interview. The information we collect will be used to understand the process of adoption and implementation process of the Healthy Stores Program in local organizations on the Navajo Nation and to inform next round of implementation of the Healthy Stores Program on the Navajo Nation. You will be given a small gift certificate (like a gift card to a local store, a coffee mug), in appreciation for your time.

Do you have any questions? If you do not wish to participate in this study, please feel free to say so. If you chose not to participate it will not affect your job in any way.

If you have any additional questions about your participation in this study and would like to speak with someone about this project, please feel free to contact the project coordinator, [REDACTED] Principal Investigator [REDACTED] Navajo Nation Human Research Review Board [REDACTED] and call the Johns Hopkins Bloomberg School of Public Health IRB office [REDACTED].

Thank you for your time and patience.

If you agree to participate in this study, please sign your name below:

Subject's signature

Witness of Consent Procedures (Optional)

Signature of Investigator

NOT VALID WITHOUT THE
COMMITTEE OR IRB STAMP OF
CERTIFICATION

_____ CHR NO. Date _____
Date

Note: Signed copies of this consent form must be a) retained on file by the Principal Investigator; b) given to the participant and c) put in the patient's medical record (when applicable)

APPENDIX B: INTERVIEW GUIDE – INTERVENTIONIST

REASSURE CONFIDENTIALITY! ALL INFORMATION WILL BE KEPT CONFIDENTIAL AND ONLY ACCESSIBLE TO THE EVALUATOR. NO NAME, IDENTIFIABLE INFORMATION WILL BE REVEALED TO ANY ONE.

THE NEXT SECTION DEALS WITH INTERVENTION IMPLEMENTATION (Q1-6)

1. Please tell me about the role you played when your program was considering adopting the Healthy Stores Program?
2. What did you expect to happen when adopting the Healthy Stores Program?
3. In the beginning, what were some concerns or anticipated problems that you or other members of your program had about adopting the Healthy Stores Program?
4. Tell me what exactly did you do to implement the Healthy Stores intervention?
5. How was Healthy Stores intervention implemented differently from originally planned? Why?
6. How do you measure the success of the Healthy Stores intervention?

THE NEXT SECTION DEALS WITH PROGRAM IMPLEMENTATION AND ADAPTATION (Q7-10)

7. What were the similarities between implementing the Healthy Stores intervention and implementing your regular program activities? What were the differences?
8. What were challenges to implement the Healthy Stores intervention at the same time as you were running your regular program activities?
9. What changes or adjustments were made within your program to adapt to these challenges?
10. What changes or adjustments were made to the Healthy Stores intervention to adapt to these challenges?

THE NEXT SECTION DEALS WITH IMPACT ON ORGANIZATIONAL PRACTICE (Q11-14)

11. What impact did the Healthy Stores Program have on your job?
12. What impact did the Healthy Stores Program have on your program in general?

13. What impact did the Healthy Stores program have on the community and the stores?
14. What impact did support from the Johns Hopkins University in terms of capacity building activities have on your staff and your program?

THE NEXT SECTION DEALS WITH BARRIERS AND STRATEGIES (Q15-19)

15. What major barriers did your program encounter in implementing the Healthy Stores intervention?
16. What strategies were used by your program or yourself to address these barriers?
17. Which strategies have worked well and what have not worked as well? Why?
18. What could have done better in terms of support from the Johns Hopkins University?
19. What else should I know about how your program adopted and implemented Healthy Stores intervention? Did I miss anything?

Thank you for your time.

APPENDIX C: LIST OF DOCUMENTS REVIEWED

Subject area	Related documents	Sources
Development, implementation, and evaluation of the Navajo Healthy Stores Program	<ul style="list-style-type: none"> • Research/grant proposal • Reports to funding agencies • Community reports • Journal articles • Conference presentations/posters • Intervention manual of procedure 	Principal investigator
Development, implementation, and evaluation of the Apache Healthy Stores Program	<ul style="list-style-type: none"> • Research/grant proposal • Journal articles • Conference presentations/posters • Formative research (data collection plan, data collection progress report, in-depth interview guide and write-ups, presentation slides) • Reports (quarterly, annual) to funding agencies, NNHRRB and Navajo agencies and chapters • NHS policy brief • Teleconference minutes • Meeting minutes • Community workshop • (agendas, attendance sheet, invitation flyers, presentation slides, reports, notes) • Capacity building workshop (agendas, attendance sheets, presentation slides, workshop minutes, notes) • Newspaper articles • Interventionist training (Intervention manual of procedure, agendas, attendance sheets, presentation slides; interventionist assignment) 	Principal investigator Plus the researchers' own field notes

	sheet, training notes, <ul style="list-style-type: none"> • Store recruitment (Memorandum of Understanding, recruitment letters, store supermarket list) • Evaluation (outcome evaluation instruments: e.g, AIQ, process instruments (store visit log, interventionist log) • Memorandum of Understanding between JHU and NSDP • Email communication (e.g., progress updates) 	
The NSDP internal document	<ul style="list-style-type: none"> • Project work plan (FY2006, FY2008, FY2009) • Interim reports to funding agency (FY2005, FY2008, FY2009) • Project services and accomplishments • Organization chart • Daily report sheet • Monthly report sheet • Annual standards-nutritionist and- community health worker • Newsletter • Grant application (FY2010) 	<ul style="list-style-type: none"> • NSDP central office managers • http://www.nnsdp.org/

APPENDIX D: THE FINAL CODING TEMPLATE

Program background

- Research proposal
- Previous trial
 - Intervention development
 - Intervention components
 - Intervention implementation
 - Intervention evaluation

Perception about the program

- Program beneficiary
- Intervention materials
- Intervention implementation
 - Interactive educational sessions
 - demonstrations
 - customers responses /interests
 - Implementation frequency
 - Use of intervention materials
- Intervention impact
 - Customers
 - Store
 - Benefit personally

Program planning/community engagement

- IRB and community approval
- Formative research
 - Data collection
 - Stakeholder involvement
- Community workshop
 - Stakeholder involvement
- Partnership initiation
 - Relationship building

Program adaptation

- Modification of intervention components
- Stakeholder involvement

Partnership agreement

- MOU
- Other agreements
- Issues/concerns

Planning for implementation

- Staff selection
- Staff training
- Resource allocation
- Other support

Intervention implementation

- Working with stores
 - Stores recruitment
 - Initial concerns
 - Relationship building
 - Conducting educational sessions
 - Store support
 - Stocking healthy foods
 - Barriers/concerns
 - Customers related factors
 - Supplier related factors

Implementation support

- Booster training
- Teleconference
- Feld facilitation
- Process data
 - Internal reporting
 - Interventionist log

Capacity building

- Needs for capacity building
- Capacity building workshops
- Impact
 - Practitioner level
 - Organizational level
 - Inter-organizational

Program evaluation and sustainability

- Outcome evaluation
- Feedback
 - JHU to NSDP
 - NSDP to JHU
- Round-two implementation
 - Training
 - Material provision
 - Other support
- Funding
- Commitment
 - Continuing support
 - Future collaboration

Organizational factors

- Program champion
- Supervisor buy-in
 - Involvement
 - Communication
 - Keep in/out of loop
 - The values and benefits of the program
 - Connections with the program objectives
- Perceived needs and benefits
- Fitting into job schedule
 - Time management
 - Staff shortage
- Program management/implementation oversight
 - Coordination/Manager turnover
 - Written roles and responsibilities
 - Structural and procedural support
 - Resource and budget

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CURRICULUM VITAE

Muge Qi

Birth date and place: October 13, 1973, Inner-Mongolia, China

EDUCATION

- 2014 Ph.D, Human Nutrition, Department of International Health, Johns Hopkins University, Bloomberg School of Public Health, Baltimore, MD. Thesis title: “Understanding the process and key factors of community implementation of a food store-based nutrition intervention on the Navajo Nation”
- 2006 M.H.S., with concentration in Nutritional Epidemiology, Department of International Health, Johns Hopkins University, Bloomberg School of Public Health, Baltimore, MD.
- 1999 M.S., Microbiology, College of Life Science, Nankai University, Tianjin, China.
- 1995 B.A., Biology, College of Life Science, Liaoning University, Shenyang, China.

PROFESSIONAL EXPERIENCE

- 2009-2010 **Teaching Assistant** for a graduate level course “Assessment of Nutritional Status”.
Responsibility: Prepared class materials, demonstrated students anthropometric, biochemical, and dietary assessment techniques and laboratory exercises, graded assignments and exams, and offered a lecture on Metabolic Syndrome.
- Teaching Assistant** for a graduate level course “Food and Nutrition Policy”.
Responsibility: Prepared class materials, advised class assignments and graded assignments.
- 2007-2008 **Co-investigator.** Center for Human Nutrition, The Johns Hopkins University, Bloomberg School of Public Health, Baltimore, MD.

Responsibilities: Designed and conducted research “Understanding the Impact of Food Assistance Programs Usage on Diet among American Indians”.

Research Assistant. The Navajo Healthy Stores Project. Center for Human Nutrition, The Johns Hopkins University, Bloomberg School of Public Health, Baltimore, MD.

Responsibilities: Assisted formative research, intervention design and material development; analyzed formative research data and reporting results to the communities and sponsors; facilitated and provided capacity-building workshops and trainings.

2006-2007 **Research Assistant.** Center for Human Nutrition, The Johns Hopkins University, Bloomberg School of Public Health, Baltimore, MD.
Responsibilities: Analyzed Food Source survey and 24-hour dietary recall data; Assisted in developing a quantitative Navajo Food Frequency Questionnaire; Analyzed data for the psychosocial determinants of food purchasing and consumption patterns among caregivers and focus child in Native Hawaiian and Pacific Islander populations.

Teaching Assistant for a graduate level course “Food, Culture, and Nutrition”.

Responsibility: Prepared class materials, advised discussion groups on class projects, graded assignments and exams, and offered a lecture.

2005-2006 **Research Assistant.** Center for Human Nutrition, The Johns Hopkins University, Bloomberg School of Public Health, Baltimore, MD.
Responsibilities: Analyzed data for the NIH-funded project, “Healthy Eating and Active Lifestyle from school To Home for Kids”; assessed calcium absorption in pre-and post-menopausal women using Mass Spectrometer.

1999-2000 **Research Scientist.** Tianjin Environmental Protection Bureau, Tianjin, China.
Responsibilities: Started up a microbiology laboratory, and conducted research on identification of microbial strains for biodegradation of toxic organic compounds in industrial sewage.

1996-1999 **Research Assistant.** College of Life Science, Nankai University, Tianjin, P.R.China.
Responsibilities: Designed and conducted research on the Mechanism of The Chitinolytic System of Streptomyces Sp. S01 on Inhibition of Plant-Pathogenic Fungi and Biological Controls of Plant Fungal Diseases.

- 1996 **Teaching Assistant.** College of Life Science, Nankai University, Tianjin, China.
Responsibilities: Offered weekly lab lecture, taught laboratory techniques, assisted in grading laboratory reports for the undergraduate level course: Microbiology.
- 1995 **Research Assistant.** College of Life Science, University of Inner Mongolia, Hohhot, Inner-Mongolia.
Responsibilities: Conducted research on detecting the Infectious Bursal Disease Virus (IBDV) using Nucleic Acid Spot Hybridization with 32P Labeled cDNA Probe.

RESEARCH GRANTS

1. Building a Healthy Food Environment: Sustaining a Community-based Environmental Intervention Program to Improve Diet and Health in American Indian Communities

Sponsoring Agency: The Johns Hopkins Center for a Livable Future (CLF)

Role: Principal Investigator

Dates: 10/07-10/08

Project: Examined the process of transferring a research-based nutrition intervention program to a community-based organization, and how this contributes to long-term sustainability of the program on two American Indian reservations.

Responsibility: Design, implementation, analysis and report-writing of research results.

2. Understanding the Impact of Food Assistance Programs Usage on Diet among American Indians

Sponsoring Agency: The University of Arizona Native People Technical Assistance Office, USDA/ERS American Indian Ridge Program

Role: Co-Investigator, (PI: Dr. Joel Gittelsohn)

Dates: 7/07 – 12/09

Project: Examined the relationship between the Food Assistance Program (FAP) usage patterns and dietary quality among participants, and develop culturally appropriate nutrition intervention components.

Responsibility: Design, implementation, analysis and report-writing of research results.

PROFESSIONAL ACTIVITIES

Workshops/Trainings

2nd Annual NIH Conference on Science of Dissemination and Implementation: Building Research Capacity to Bridge the Gap from Science to Service. January 28-29, 2009. Natcher Conference Center, NIH Campus, Bethesda, MD.

Nutrition Evidence Library (NEL) Evidence Abstractor Training. August-December, 2008. USDA Center for Nutrition Policy and Promotion, U.S. Department of Agriculture
Alexandria, VA

The International Institute for Qualitative Methodology 8th Annual Thinking Qualitatively Workshop Conference, June 23-27, 2008. University of Alberta, Edmonton, Alberta, Canada.

Built Environment Assessment Training (BEAT) Institute, June 15-20, 2008. Emory University Rollins School of Public Health, Atlanta, GA.

HONORS AND AWARDS

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| 2008 | The Elsa Orent Keiles Scholarship in Human Nutrition, The Johns Hopkins University, Bloomberg School of Public Health, Baltimore, MD |
| | Nutrition Evidence Library (NEL) Evidence Abstractor for 2010 Dietary Guidelines Advisory Committee, USDA Center for Nutrition Policy and Promotion, Alexandria VA. |
| | Built Environment Assessment Training (BEAT) Institute scholarship, Emory University Rollins School of Public Health, Atlanta, GA. |
| 2007 | The Harry D. Kruse Fellowship in Nutrition, The Johns Hopkins University, Bloomberg School of Public Health, Baltimore, MD. |
| | The Center for Livable Future Faculty and Student Innovation Grants Award, The Johns Hopkins University, Bloomberg School of Public Health, Baltimore, MD. |
| 1997-1999 | Outstanding graduate student scholarship, Nankai University, Tianjin, China. |
| 1995 | Graduate with High Distinction, Liaoning University, Shenyang, China. |
| 1992-1995 | Excellent student scholarship, Liaoning University, Shenyang, China. |

PUBLICATIONS

Journal Articles

Sharma, S., Yacavone, M., Cao, X., Pardilla, M., Qi, M., Gittelsohn, J. Dietary intake and development of a food-frequency questionnaire for a nutritional intervention to reduce the risk of chronic disease in the Navajo Nation. (*Public Health Nutrition*, July 2008.)

PRESENTATIONS

- 2008 Qi, M., Gittelsohn, J., Pardilla M. et al. The 136th American Public Health Association (APHA) Annual Meeting & Exposition. "Food Environment on the Navajo Nation: the Availability of Healthy Foods by Food Source." San Diego, CA. October 25-29, 2008.
- 2008 Qi, M., Gittelsohn, J., Steckler, A. Society of Public Health Education (SOPHE) 59th Annual Meeting. "Transferring research-based interventions to the community: Key role of capacity-building." San Diego, CA. October 23 - 25, 2008.
- 2008 Qi, M., Gittelsohn, J. 2008 Research Innovation and Development Grants in Economics (RIDGE) Conference. "**Understanding the Impact of Food Assistance Program Usage on Diet among American Indians**". Economic Research Service, Washington, D.C. October 16-17, 2008
- 2006 Qi, M., Wang, Y. The 2006 Society of Obesity (NASSO) Annual Scientific Meeting. "Tracking of Physical Activity and Sedentary Behavior in Urban Low-income African American Adolescents." Boston, MA, October 20 – 24, 2006.

WORKSHOPS/TRAINING ORGANIZED

- Feb 08 **Organizer and Instructor.** Window Rock, AZ. "Capacity-building Workshop: Program Evaluation."
- Feb 08 **Organizer and Instructor.** San Carlos, AZ. "Capacity-building Workshop: Program Modification and Material Development".
- Jan 08 **Organizer and Instructor.** San Carlos, AZ. "Capacity-building Workshop: Using Conceptual Frameworks in Program Design and Evaluation."
- Nov 07 **Organizer and Instructor.** Window Rock, AZ. "Capacity-building Workshop: Program Implementation and Interventionist Training."
- Aug 07 **Organizer and Instructor.** San Carlos, AZ. "Capacity-building Workshop: Program Evaluation, Instrument Development, Data Collector Training."

Jan 07 **Organizer and Instructor.** Window Rock, AZ. "Navajo (Diné) Healthy Stores Intervention Approaches Workshop."

LANGUAGE

Chinese, Mongolian; fluent speaking, reading, writing
Japanese; intermediate speaking, reading, writing ability