



HHS Public Access

Author manuscript

Prog Community Health Partnersh. Author manuscript; available in PMC 2019 June 19.

Published in final edited form as:

Prog Community Health Partnersh. 2017 ; 11(4): 417–425. doi:10.1353/cpr.2017.0049.

Yéego Gardening!: A Community Garden Intervention to Promote Health on the Navajo Nation

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Abstract

Background: *Yéego Gardening!* is a community garden intervention to increase gardening behavior, access to low-cost fruit and vegetables, and ultimately increased consumption in Navajo communities.

Objectives: To design a theory-based, culturally relevant intervention with three components: a community garden, monthly workshops on gardening and healthy eating, and community outreach.

Methods: Gardens were constructed and maintained in collaboration with community-based organizations in 2 Navajo communities. Monthly workshops were held throughout the growing season which incorporated aspects of Navajo culture and opportunities to build confidence and skills in gardening and healthy eating behaviors. In addition, program staff attended community events to promote gardening and healthy eating.

Conclusions: Community input was essential throughout the planning and implementation of the intervention. If effective, community gardens may be a way to increase fruit and vegetable availability and intake, and ultimately reduce risk of obesity and diabetes.

Background

American Indians and Alaskan Native (AI/AN) are at increased risk for obesity and diabetes in part due to their diet, including the low consumption of fruits and vegetables [1–5]. Current Dietary Guidelines for Americans recommend 2.5 cups (approximately 5 servings) of vegetables a day and at least one cup (two servings) of fruit [6]. Yet, more than half the adult members of the Navajo Nation consume fewer than two servings of fruits and vegetables combined. By comparison, only 3% of U.S. adults consume fewer than 2 servings fruits and vegetables per day [7].

Several factors contribute to the low consumption of fruits and vegetables among Navajo, including lack of access to fresh fruits and vegetables, the high cost of fruits and vegetables, and barriers to growing fruit and vegetables. We designed an intervention to address increase consumption of fruits and vegetables by addressing many of these factors. Ultimately, by increasing fruit and vegetable intake, we aim to prevent and reduce risk for obesity, as well as diabetes and other related morbidities among Navajo.

Our intervention was also designed to address the unique context of American Indians living in the Northeast region of the Navajo Nation which also lies in the state of New Mexico. In New Mexico between 2004 – 2007, over 80% of Navajo were considered to be overweight or obese [8]. Residents of the Navajo Nation have experienced the additional barriers of historical erosion of traditional growing knowledge, policies that limit access to healthy foods, high rates of food insecurity, and long distance commutes for employment and services [9–13].

Using Gardens to Promote Healthy Eating among Navajo Families

Many Navajo communities have focused on strengthening traditional values and knowledge as a way to improve the health of Native people [14–16]. Navajo communities have specifically expressed an interest in gardening as a way to return to traditional customs that includes hunting, herding and farming. In the traditional Native American diet, farming and food are interwoven into a balanced, healthy lifestyle for maintaining life, including preparing traditional dishes, celebrating and honoring culture, and strengthening family and community relationships [11, 16–20].

Community gardens are shared open spaces where individuals garden together to grow fresh, healthy and affordable fruits and vegetables. Community gardens have shown promise as way to prevent diabetes and obesity and promote a healthy diet [17, 21]. Previous studies have found that those that participate in community gardens have healthier diets because they consume what they help to produce [22]. A local garden can provide better access to a wider variety of nutritious food, especially in areas that are “food deserts [23].” Growing food locally reduces the need to purchase fruits and vegetables, addressing the issue of high cost. This is particularly relevant for the Navajo considering high levels of poverty and food insecurity [1, 24–26]. Despite the potential of community gardens, there are also several unique barriers to growing fruits and vegetables on the Navajo Nation (varying to some degree across the Nation in terms of both horticultural and traditional considerations), including limited access to water, and limited gardening knowledge and skills [27, 28].

The goal of our study was to develop a theory-based and culturally relevant community garden intervention to increase gardening and fruit and vegetable consumption in two Navajo communities. In this paper we describe our process of designing the intervention in partnership with Navajo community members.

Methods

Developing an Academic-Community Partnership

The Navajo Nation, with over 250,000 members, is the largest federally recognized tribe within the United States, encompassing nearly 70,000 km². The Navajo Nation comprises an area larger than 10 of 50 of the United States within parts of three states: Arizona, NM, and Utah [24]. The region is semi-arid though there are significant rangelands, forests and irrigated farmlands.

Researchers from New Mexico State University (NMSU) and the Fred Hutchinson Cancer Research Center (FHCRC) have worked closely with members of the Navajo Nation over the past eight years to build a trusting and collaborative relationship. However, the relationship between the NMSU Agricultural Science Center and the Navajo Nation dates back over fifty years, with the center being one of the only land-grant universities in the United States to lease land on a sovereign tribal nation. Activities for this project began with informal meetings between NMSU faculty member, Kevin Lombard, and representatives from local Navajo institutions, such as Diné College and Indian Health Services, to elicit community members' interest in gardening and health. Later, the research team sought formal Chapter house (community centers of governance) resolutions documenting community support for research on healthy eating and community gardens. We have also sought and maintained approval from the Navajo Nation Human Research Review Board (NNHRRB) in addition to approval from FHCRC and NMSU human subjects review committees over the last six years for our work around gardening for health. Having NNHRRB approval helps maintain trust with participants, but also helps facilitate the transfer of research results to tribal government officials (e.g. Navajo Nation Division and Health) and the legislative council at Window Rock, the Navajo Nation capital. For example, the NNHRRB hosts researchers who conduct research in the Navajo Nation to present their research findings back to local programs, agency representatives and community members.

For project stability and sustainability, we have maintained connections with community members and local institutions, such as tribal leaders, Diné College, Navajo Technical University, New Mexico State University agricultural extension agents, and the Indian Health Service. These connections were critical in identifying space and support for the gardens and project activities. These community advisors also offered guidance in how to maintain the gardens and ensure that project activities were culturally relevant and appropriate. Regular meetings helped coordinated projects activities across institutions to avoid duplication of effort and further develop collaboration. Community advisors were also compensated for their time and travel to attend the meetings.

Formative Research on Gardening and Health

In 2008 and 2011, we conducted seven focus groups with Navajo participants (N = 31) in three communities who identified diabetes and cancer as health concerns. These adverse health concerns were in part attributed to barriers to healthy eating and to the loss of health promoting aspects of traditional Navajo culture [11]. Focus group participants identified gardening as a way to promote healthy eating and Navajo traditions. Specifically, they recommended a course that taught basic gardening skills. They also identified not having space to garden, lacking time to garden, limited access to water and poor soil quality as barriers to gardening.

Community Garden Sites

Based on this formative work, we developed a community garden intervention (*Yéego [Let's Go] Gardening!*) in two communities on the Navajo Nation. One garden is located in Crownpoint, New Mexico at the Office of Diné Youth (ODY), and the other is located near the Shiprock Chapter House at Dream Diné Charter School in Shiprock, New Mexico. The sites were chosen because of ongoing gardening initiatives and/or community interest in starting new gardens, as well as their proximity to NMSU-ASC Farmington, Diné College (Shiprock), Navajo Technical University (Crownpoint), and NMSU cooperative extension support.

Crownpoint.—Crownpoint is located approximately 97 km south of Farmington with a total population of approximately 2,330. It is home to the annual Eastern Agency Navajo Fair; Navajo Technical University; a branch campus of Diné College; an IHS hospital, and a branch office of the Navajo Special Diabetes Unit. In this community, a Crownpoint-based NMSU Cooperative Tribal Extension agent had worked with the Office of Diné Youth (ODY), an after school program, to build a garden plot on-site. The community garden site consisted of an in-ground garden plot that was 13 by 11-meters and a hoop house with raised garden beds for growing season extension into cooler months. The site was fenced to prevent animal browsing.

Shiprock.—Shiprock is part of the Farmington Metropolitan Statistical Area and is about 48 km from Farmington with a population of 9,649 [29]. It is home to the annual Northern Navajo Fair and a branch campus of Diné College, Bureau of Indian Affairs, an IHS hospital, a branch office of the Tri-State Agricultural Extension Service, a branch office of NMSU Cooperative Extension, and a branch office of the Navajo Special Diabetes Unit. At the time the study began there had been a previous community garden initiative in Shiprock led by an Indian Health Services staff member. However, this site was not located near any other community services and few community members were engaging in maintaining the garden. For this reason, we sought a new location for the community garden near the Shiprock Chapter House and a charter elementary school.

Formative Research to Inform Yéego Gardening!

In 2014, after garden sites were chosen we conducted an additional focus group in each community about issues specific to that community and to gather input on designing and implementing a community garden intervention (N = 12). Focus group question participants

included community residents and representatives from local institutions including Diné College, Navajo Technical University, Indian Health Services, and the Crownpoint ODY. Participants were provided \$20 gift cards as an incentive. Focus groups were moderated by a trained member of the research team, using a focus group guide that asked about traditions of gardening, current gardening practices, what residents wanted to know about gardening, and community attitudes about gardening. Recordings and notes from the focus groups were reviewed by multiple members of the research team to identify consistent themes. Results were also presented to community advisors to help interpret the findings.

Results

Findings from Focus Groups to Inform Yéego Gardening!

Participants in the 2014 focus groups confirmed the findings from previous focus groups, identifying many barriers to gardening in both communities. These included limited access to water, poor soil quality, and difficulty keeping out weeds. Many participants shared the need to share stories and traditional gardening practices with the next generation so that the knowledge of elders was not lost. Participants also identified local residents that could serve as presenters at gardening workshops. Some had concerns about the ownership of the garden and the produce that would result. They recommended that the gardens be planted with squash, corn, and tomatoes which are commonly used in traditional Navajo dishes.

Participants identified the following as being good topics for gardening workshops: how to start a garden, irrigation and water quality, how to garden at your own house, when to harvest, how to prepare/cook what you harvest. Participants also encouraged staff to make the workshops interactive, including demonstrations and hands-on learning, handouts with pictures, including traditional practices and ways of learning. They also suggested that workshops be held on evenings and weekends, and that people should be encouraged to attend with family members. It was recommended that the project be publicized widely, including on social media and with flyers in the community. In general, findings were consistent across focus groups. However, in Shiprock there was a stronger tradition of farming and better access to water, while Crownpoint was noted as a more arid area with less access to water and a stronger tradition of raising livestock.

Yéego Gardening!: Intervention Description

Using Social Cognitive theory, the focus group findings and input from our community partners, we developed an intervention consisting of three integrated components: 1) a community/demonstration garden plot, 2) technical assistance workshops to increase gardening and healthy eating and 3) community outreach. We chose Social Cognitive Theory because it asserts that health behaviors are influenced by both personal factors and their social and physical environment (which was consistent with our focus groups findings and input from community advisors). The theory also helped identify mediators of gardening and healthy eating, that we could target in the intervention. These three intervention components aimed to increase gardening and healthy eating by increased access to fresh produce grown in the community gardens, as well as by increasing participants' self-

efficacy, self-monitoring and behavioral capability to garden, prepare and consume fruits and vegetables (Figure 1). Each component is described in more detail below.

Community Garden Plot

The centrally located community garden plots serve as a place for community members to garden, and as classrooms for the gardening workshops. The physical garden infrastructure includes water conserving irrigation (supply and installation of drip irrigation and hose pipe), plant material (annual and perennial vegetables and fruit trees), fencing, growing season extending hoop houses and other garden construction as needed. The highly visible garden spaces are also intended to promote positive social norms around gardening.

At the Crownpoint site, the garden is located west of the ODY building but centrally located by the Crownpoint High School. ODY is also home to several programs including summer youth employment, girl scouts and community events. At this site, we installed four 1 m² grow boxes; a mobile garden bed that can be used to start seedlings inside; a tumbling composter; and, four fruit trees (apple and peach). Future plans for the facility include building a smaller season extending hoop house. NMSU staff also provided assistance with garden maintenance and disassembly of the current hoop house in preparation for future construction to expand the garden site. During the 2015 growing season, chili, corn, squash, watermelon, and zucchini were planted and cultivated.

The Shiprock garden is located adjacent to both a charter elementary school and the local chapter house (Figure 2). The garden has high visibility and accessibility for school staff, students and family members. At this site, we installed seven 1 × 2.5 m raised garden beds with imported soil to preserve potential buried archeology. The project also added a greenhouse, a space for composting, and four fruit trees. In addition, a 3,000 L (800 gal) rain catchment water tank and concrete block tank were installed. All of these improvements were paid for by the research grant. During the 2015 growing season, chili, gourd squash, tomatoes, lavender, and corn were planted and cultivated.

Gardening Workshops

A second component of our intervention was to provide workshops at the garden sites to address some of the identified barriers to gardening (Table 1). Prior to our intervention, there were other community institutions, such as NMSU, Diné College, and Navajo Technical College providing occasional gardening workshops and NMSU Cooperative Extension Service operated a Master Gardener program. Our workshops sought to complement these programs by providing additional information in a more accessible format for beginning gardeners. At each workshop, we prepared and provided a handout on the topics covered. These self-help materials complemented the hands-on experience in the workshops and were also used for community outreach. The handouts sought to encourage gardening and healthy eating through increased self-efficacy, behavioral capability, and self-monitoring tools (Table 2). Self-efficacy refers to confidence in ability to change behavior, behavioral capability includes knowledge and skills to change behavior, self-monitoring includes keeping track of behaviors, and social norms refer to expectations of behavior in the group to which one belongs [30]. Elements of Navajo culture were also incorporated into the workshops, such as

story-telling describing the interconnectivity between food, culture, and other traditional practices. The workshops were facilitated by the Project Coordinator, who is also member of the Navajo Nation, and often included guest presenters who were also Navajo for special topics, such as healthy cooking, and use of plants for traditional medicine.

Community Outreach

We also aimed to increase social norms about gardening and fruit and vegetable consumption through outreach activities. Research team members regularly attended community events (such as chapter meetings, community conferences and community health fairs) to provide information about the community garden plots and workshops. They also provided educational materials, including handouts from the garden workshops to community members with an interest in gardening or healthy eating. Community outreach efforts also resulted in media coverage. The 2015 Shiprock kick-off event was featured in the Farmington Daily Times and Albuquerque Journal newspapers [31]. A short description of the project was also announced on a prominent news channel based in Albuquerque.

Conclusions

Integrating the expertise of both the research team and the local community, we developed a community garden intervention to improve consumption of fruits and vegetables among residents in two communities on the Navajo Nation. The contribution of the research team was developing intervention components based on health behavior theory, and providing expertise on gardening and healthy eating.

Equally important was the input from the Navajo community. Building and maintaining long-term trusting relationships with community members and local institutions was critical to getting their input and collaboration on the project. Other studies have pointed to the need to involve community members in the planning of community garden projects, especially in American Indian communities [32, 33]. We found that it was important to use community input from various sources and at various points in the intervention development. For example, our original curriculum for the workshops was based on a non-Navajo, scientific-based, Master Gardening curriculum that had been used previously by Agricultural Extension agents on the Navajo Nation. However, after receiving feedback from workshop participants we adjusted the curriculum so that it met the needs and literacy level of beginning Navajo gardeners.

This project is one of the few community garden interventions developed specifically for American Indians living on the Navajo Nation [32]. It explicitly included aspects of Navajo culture, such as storytelling, growing practices, and how to prepare traditional foods, that would resonate with participants and help retain traditional practices. The workshops were also designed to reflect the unique challenges of gardening in this region. Many previous community garden interventions have focused on urban settings. While urban settings also suffer from limited access to fresh fruits and vegetables and limited space to garden, rural environments also present challenges. In the case of the Northeast Navajo Nation, these challenges included a short growing season related to a high elevation desert climate, degraded soil quality, and pests such as prairie dogs. In the workshops, participants were

taught how to address these challenges both in the community garden and in gardens they maintained at home.

Previous studies have showed that in order to impact fruit and vegetable consumption, community garden interventions should include an education component [34, 35]. The education component in our intervention were workshops, which aimed to build the self-efficacy, behavioral capability and social norms about both gardening and healthy eating. The last three workshops focused specifically on how participants could use the fruits and vegetables they harvested, through cooking, canning and storing. Other studies have found that fruit and vegetable consumption is higher among participants that actually work in the community garden [36, 37]. This suggests that in addition to the educational component, it's important to include hands-on activities and opportunities to participate in gardening in a community garden intervention. Community outreach may also bolster the impact of the other intervention components by reminding participants and increasing social norms around gardening and healthy eating.

Community gardens have the potential to increase both the availability and consumption of fruits and vegetables. Our team is currently evaluating the impact of the Yéego Gardening! Program. This evaluation will assess whether participants in the program report different gardening and healthy eating behaviors after participating in the program. We also plan to assess whether changes in gardening and healthy eating are mediated by theoretical constructs, such as self-efficacy and behavior capability, as well as which types of education and participation are most effective in changing behaviors. If effective, interventions such as Yéego Gardening!, can improve the food environment in areas with limited access to healthy foods. Increasing access and knowledge about eating behaviors may ultimately reduce risk for obesity and diabetes in Navajo communities, and promote the retention of traditional diets and customs.

References

1. Espey DK, et al., Annual report to the nation on the status of cancer, 1975–2004, featuring cancer in American Indians and Alaska Natives. *Cancer*, 2007 110(10): p. 2119–52. [PubMed: 17939129]
2. Wiggins CL, et al., Gastric cancer among American Indians and Alaska Natives in the United States, 1999–2004. *Cancer*, 2008 113(5 Suppl): p. 1225–33. [PubMed: 18720378]
3. Jernigan VB, et al., Changing patterns in health behaviors and risk factors related to cardiovascular disease among American Indians and Alaska Natives. *Am J Public Health*. 100(4): p. 677–83. [PubMed: 20220114]
4. Barnes PM, Adams PF, and Powell-Griner E, Health characteristics of the American Indian or Alaska Native adult population: United States, 2004–2008. *Natl Health Stat Report*, 2010(20): p. 1–22.
5. Stang J, Improving health among American Indians through environmentally-focused nutrition interventions. *J Am Diet Assoc*, 2009 109(9): p. 1528–31. [PubMed: 19699831]
6. Dietary Guidelines for Americans 2015 – 2020, U.S. Department of Health and Human Services and U.S. Department of Agriculture, Editor. 2015.
7. Guenther PM, et al., Most Americans eat much less than recommended amounts of fruits and vegetables. *J Am Diet Assoc*, 2006 106(9): p. 1371–9. [PubMed: 16963342]
8. Slaterry ML, et al., Associations among body mass index, waist circumference, and health indicators in American Indian and Alaska Native adults. *American Journal of Health Promotion*, 2010 24: p. 246–254. [PubMed: 20232606]

9. Setala A, et al., The potential of local farming on the Navajo Nation to improve fruit and vegetable intake: barriers and opportunities. *Ecol Food Nutr*, 2011 50(5): p. 393–409. [PubMed: 21895419]
10. Setala A, et al., Linking farmers to community stores to increase consumption of local produce: a case study of the Navajo Nation. *Public Health Nutr*, 2011 14(9): p. 1658–62. [PubMed: 21450136]
11. Lombard KA, et al., Healthy gardens/healthy lives: Navajo perceptions of growing food locally to prevent diabetes and cancer. *Health Promotion Practice*, 2013.
12. Pardilla M, et al., High levels of household food insecurity on the Navajo Nation. *Public Health Nutrition*, 2014 17(1): p. 58–65. [PubMed: 23369257]
13. Cunningham-Sabo LD, et al., Qualitative investigation of factors contributing to effective nutrition education for Navajo families. *Maternal Child Health Journal*, 2008 12: p. S68–S75.
14. Gittelsohn J, et al., A food store-based environmental intervention is associated with reduced BMI and improved psychosocial factors and food-related behaviors on the Navajo nation. *J Nutr*, 2013 143(9): p. 1494–500. [PubMed: 23864511]
15. Fleischhacker S, et al., Promoting physical activity among native American youth: A systematic review of the methodology and current evidence on physical activity interventions and community-wide initiatives. *Journal of Racial and Ethnic Disparities*, 2015 1: p. 1–17.
16. Patchell B and Edwards K, The role of traditional foods in diabetes prevention among Native Americans. *Current Nutrition Report*, 2014 3: p. 340–344.
17. Lombard KA, et al., Diabetes on the Navajo Nation: What role can gardening and agriculture extension play to reduce it? *Rural and Remote Health*, 2006 6(640).
18. Setala A, et al., Linking farmers to community stores to increase consumption of local produce: a case study of the Navajo Nation. *Public Health Nutrition*, 2011 14(9): p. 1658–1662. [PubMed: 21450136]
19. Mihesuah D, Decolonizing our diets by recovering our ancestors' gardens. *American Indian Quarterly*, 2003 27(3&4): p. 807–839.
20. Mihesuah DA, *Recovering Our Ancestors' Gardens: Indigenous Recipes and Guide to Diet and Fitness*. 2005, Lincoln, NB: University of Nebraska Press 194.
21. Hale J, et al., Connecting food environments and health through the relational nature of aesthetics: gaining insight through the community gardening experience. *Soc Sci Med*, 2011 72(11): p. 1853–63. [PubMed: 21596466]
22. Kamphuis CB, et al., Environmental determinants of fruit and vegetable consumption among adults: a systematic review. *Br J Nutr*, 2006 96(4): p. 620–35. [PubMed: 17010219]
23. Wakefield S, et al., Growing urban health: community gardening in South-East Toronto. *Health Promot Int*, 2007 22(2): p. 92–101. [PubMed: 17324956]
24. Navajo Nation, *Navajo Nation Profile*. Vol. 2006. 2006, Washington, D.C.: Navajo Nation Washington Office.
25. U.S. Census Bureau, *Personal income per capita in constant (2000) dollars \1 2004*. Vol. 2006. 2006, Washington D.C.: United States Census Bureau.
26. Pardilla M, et al., High levels of household food insecurity on the Navajo Nation. *Public Health Nutr*, 2014 17(1): p. 58–65. [PubMed: 23369257]
27. Devereaux J, A recipe for change on the Navajo Nation: community-based strategies to address obesity in Native American youth. *Childhood Obesity*, 2010 6: p. 237–239.
28. Smeal D and Williams Z, *Low-tech, low-cost drip irrigation system for small plots 2004 Annual Progress Report*. 2005: p. 127–133.
29. U.S._Census_Bureau. *Fact Sheet Shiprock CDP, New Mexico*. 2010 [cited 2011 May 16, 2011]; Available from: http://factfinder.census.gov/servlet/ACSSAFFacts?_event=Search&geo_id=&_geoContext=&_street=&_county=Shiprock&_cityTown=Shiprock&_state=&_zip=&_lang=en&_sse=on&pctxt=fph&pgsl=010.
30. Glanz K, Rimer B, and Viswanath K, *Health Behavior and Health Education: Theory, Research and Practice*. 4th ed. 2008: Jossey-Bass.
31. Grover H, *Project on Navajo Nation focuses on gardening skills, eating habits.*, in *The Daily times*. 2015: Farmington, NM.

32. Adams AK, et al., Using community advisory boards to reduce environmental barriers to health in American Indian communities, Wisconsin, 2007–2012. *Prev Chronic Dis*, 2014 11: p. E160. [PubMed: 25232747]
33. Gittelsohn J and Rowan M, Preventing diabetes and obesity in American Indian communities: the potential of environmental interventions. *Am J Clin Nutr*, 2011 93(5): p. 1179S–83S. [PubMed: 21411614]
34. Barnidge EK, et al., The effect of education plus access on perceived fruit and vegetable consumption in a rural African American community intervention. *Health Educ Res*, 2015 30(5): p. 773–85. [PubMed: 26338985]
35. Rustad C and Smith C, Nutrition knowledge and associated behavior changes in a holistic, short-term nutrition education intervention with low-income women. *J Nutr Educ Behav*, 2013 45(6): p. 490–8. [PubMed: 24206584]
36. Barnidge EK, et al., Association between community garden participation and fruit and vegetable consumption in rural Missouri. *Int J Behav Nutr Phys Act*, 2013 10: p. 128. [PubMed: 24252563]
37. Litt JS, et al., The influence of social involvement, neighborhood aesthetics, and community garden participation on fruit and vegetable consumption. *Am J Public Health*, 2011 101(8): p. 1466–73. [PubMed: 21680931]

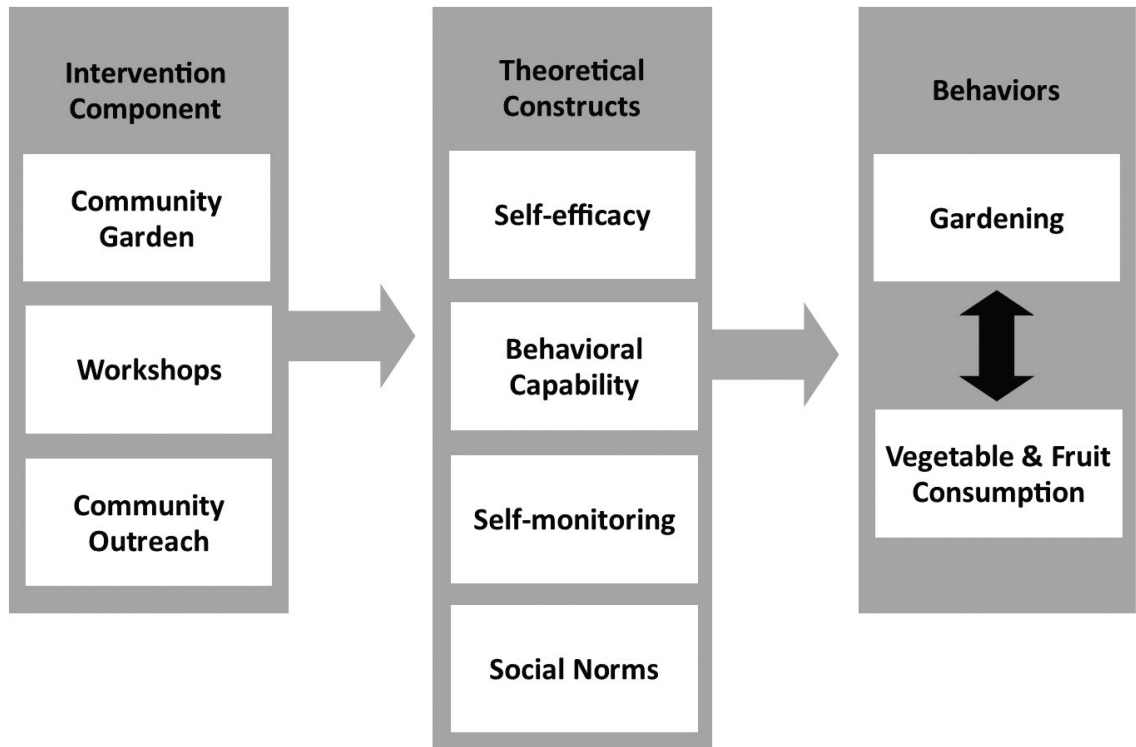


Figure 1.
Conceptual Model for the Yéego Gardening! Intervention.



Figure 2. Shiprock Community Garden showing raised garden beds and season extending greenhouse. Locating the garden adjacent to the Shiprock Chapter House ensures high visibility to community members.

Table 1.

Yéego Gardening! Events and Workshops conducted in 2015

	Topic	Timing	Topics Covered
1	Kick-off Event	Mid-March to mid-April Before first thunder/ lightening (when Winter is over)	Introduction to gardening and the project Traditional blessing of the garden Health benefits of gardening Planning your garden (choosing a site/crop/plant selection) Soil preparation Garden preparation (plan for irrigation) How to use gardening tools
2	Planting	Mid-May	Review crop selection/what to plant/where to plant How to plant (how tightly packed the soil, fertilizer, when to water) Sing planting songs, involve children in planting, reflect on our ancestors or elders gardening practices
3	Planting and Maintaining a Garden	Early June	Review crop selection Additional planting Irrigation Weeding Songs about growing Reflecting on use of water and conservation of resources Share stories of relationship with water (hauling water)
4	Maintaining a Garden	Early July	Review irrigation and weeding Provide tips on pest control including non-chemical pesticides Discuss mulching and other ways to protect garden
5	When and What to Harvest	August	Harvesting your crops, how to know when it's ripe or ready Navajo ways of knowing seasons, when to harvest Benefits of being in the garden: restful, stress-free place, meditation or prayer, medicinal or traditional uses of plants
6	When and What to Harvest	Late August/September	Review harvesting, crops that ripen off the vine Benefits of healthy eating Vitamins/nutritional content of different fruits and vegetables Discuss participation in Yeibeichei (traditional ceremony)
7	Harvest Festival	October	Cooking fruits and vegetables from the garden Canning/storing your vegetables Season extension/growing off season Storytelling about gardening and harvesting Eating traditional foods

Table 2.

Examples of How Yéego Gardening! Intervention Components Addressed Theoretical Constructs in Figure 1.

Theoretical Construct	Example
Self-efficacy	Planting: Have participants review what to plant where to build confidence Harvesting: Have participants share their own traditional knowledge of the seasons and when to harvest Food preparation: Have participants try out a healthy recipe at home
Behavioral Capability	Planting: Have participants help prepare soil mixture and use gardening tools Weeding/Pest Control: Have participants practice weeding and pest control in the community garden Food preparation: Provide a cooking demonstration and tasting
Self-monitoring	Garden Plan: Encourage participants to make a plan for home garden, while peers and instructors can provide support and feedback Planting: Have participants to set a goal for planting something at home Watering: Have participants think about how they will water their gardens at home Check-in on home gardens and allow time for questions and answers
Social Norms	Incorporating culture (such as blessings, songs, Navajo traditions) makes gardening feel familiar, aligns with traditional values and encourages participation Show value of intergenerational knowledge by encouraging children and elders to attend Encourage workshop participants to share ideas and learn from one another Showcase what is produced in the garden with the rest of the community

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