An Intervention to Promote Navajo Gardening, Nutrition and Community Wellness

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Goal & Specific Aims

- **Goal**: To improve community health and wellness by encouraging family gardening activity and improved nutrition.

- **Specific Aim 1**: Evaluate whether the intervention (integrated technical assistance, technical and behavioral workshops, and community outreach) is associated with presence of a garden in the backyard and an increase in frequency of gardening.

- **Specific Aim 2**: Assess whether the association of the intervention (workshops and community outreach) is mediated by social norms about gardening, as well as self-efficacy and behavioral capability to garden.
Background

Economic Considerations

- Navajo annual per capita income is $10,547, compared to $27,334 U.S. (U.S. Census 2010).
- Percentage of Navajo people below the poverty level is 37.7%, compared to 13.8% in the U.S. overall (U.S. Census 2010)
- Cost, availability, & shelf life of foods in remote areas affect dietary choices.

Obesity and Diabetes on the Navajo Nation

- Obesity is increasing among the Navajo (67% overweight or obese in NAIHS).
- Fruit and vegetable consumption is low: over half of adults 3 or fewer servings daily.
- 2007: Type-2 diabetes is >14% of those 20-74 years of age.
Prior Survey Results: Gardening Activity

<table>
<thead>
<tr>
<th>Stage of Change in Gardening</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Precontemplation</td>
<td>23</td>
<td>19%</td>
</tr>
<tr>
<td>Contemplation</td>
<td>41</td>
<td>34%</td>
</tr>
<tr>
<td>Planning</td>
<td>19</td>
<td>16%</td>
</tr>
<tr>
<td>Action</td>
<td>7</td>
<td>6%</td>
</tr>
<tr>
<td>Maintenance</td>
<td>30</td>
<td>25%</td>
</tr>
<tr>
<td>Total</td>
<td>120</td>
<td>100%</td>
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</table>

This question was based on the Stages of Change model. Those in the first three groups were then categorized as “non-gardeners” and the Action and Maintenance groups were considered “gardeners.”
Prior Survey Results: Nutrition from Gardening

Of those respondents who reported daily fruit and vegetable consumption (24 hour dietary recall):

- 35 **gardeners** reported mean servings of 5.5 (SD 3.7)
- 82 **non-gardeners** reported mean servings of 3.5 (SD 2.7)

- This is a significant difference: gardeners ate on average 2 more servings of fruits and vegetables (TTest p=.0035, with outliers removed)
Barriers Identified by Non-Gardeners in Survey

Money Related Issues

- Water
- Tools
- Irrigation System
- Fencing Materials
- Gas
- None
- Other

Individual Issues

- Time
- Physical Ability
- Social Support
- None
- Other

Hogback/Shiprock
Tsaile/Lukuchukai
Recommendations

- Provide workshops that feature traditional gardening methods, use of indigenous seeds, as part of “master gardening”
- Encourage use of drip irrigation, water collection, dry farming methods in areas where irrigation infrastructure is non-existent or not functioning
- Seek partners (chapters, community groups, other programs to work on broader infrastructure issues:
  - Water access – ditches, pumps, improved areas around other sources
  - Assistance kits for new gardeners
  - Equipment for loan
Proposed Intervention

- Family Gardens
  - Fencing
  - Soil Improvements
  - Drip Irrigation

- Technical and Behavioral Workshops
  - Site Preparation
  - When/what to Plant
  - Irrigation
  - Weed/Pest Control
  - Harvesting & Seed Saving
  - Healthy Cooking and Preserving
30 participating households from 4 Chapters (communities)
- Participants range from 21 to 62 years of age
- 23 Female; 7 Male
- 18 live in established housing areas; 12 rural
- 26 of the 30 households had running water
Household gardens in Intervention. Components of these gardens include fencing to keep animals out, small wood gate, drip irrigation from NTUA tap water, and soil improvements.
Materials

- materials from Home Depot, and Lowe's
- Cost material vary on site area
- Use of backhoe to dig rocky soil and pull dead trees
- Railroad ties for barrel set up

1 Shovels, 1 Hoes, 1 Rake, Fencing materials: posts, clippings, metal fencing, and post driver, gloves, face mask, drip irrigation materials: 12-20ft, 9-2ft, 2-4ft tubing, drip buttons: 10 per 20ft tubing, drip hole puncture: 1 or 2, 2 elbow connectors, 9-10 T-shaped connectors, peat moss, organic compost, and vermiculite/pearlite
Barriers
- Soil – Clay, Sand, Rocky areas at each garden sites
- scheduling for a backhoe/to remove rocks/plowing field
- Bug infestation
- Materials
- Meeting with Gardeners
- no running water/Barrel option
Data Analysis

- **Key Explanatory Variables**
  - **Knowledge:** “Do you know how to…”
    - Prepare a garden
    - Maintain a garden
    - Harvest & store fruits and vegetables
  - **Self-Efficacy:** “How confident, self-assured are you that you can…”
    - Prepare a garden
    - Maintain a garden
    - Harvest and store fruits and vegetables
    - Prepare fruits and vegetables
    - Eat fruits and vegetables every day

- **Key Outcome Variables**
  - Gardening Frequency (times/week)
  - Servings of fruits/vegetables per day
Knowledge & Self-Efficacy:

Participants reporting “a lot” of knowledge, confidence

<table>
<thead>
<tr>
<th>Knowledge: “Do you know how to…”</th>
<th>Baseline</th>
<th>Follow-up</th>
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</thead>
<tbody>
<tr>
<td>Prepare a garden</td>
<td>4</td>
<td>13.3</td>
</tr>
<tr>
<td>Maintain a garden</td>
<td>14</td>
<td>53.3</td>
</tr>
<tr>
<td>Harvest &amp; store fruits and vegetables</td>
<td>9</td>
<td>30.0</td>
</tr>
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<table>
<thead>
<tr>
<th>Self-efficacy: “How confident are you that you can…”</th>
<th>Baseline</th>
<th>Follow-up</th>
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<tbody>
<tr>
<td>Prepare a garden</td>
<td>12</td>
<td>40.0</td>
</tr>
<tr>
<td>Maintain a garden</td>
<td>20</td>
<td>66.7</td>
</tr>
<tr>
<td>Harvest &amp; store fruits &amp; vegetables</td>
<td>20</td>
<td>66.7</td>
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**Gardening & Nutrition Outcomes**

<table>
<thead>
<tr>
<th></th>
<th>Baseline</th>
<th></th>
<th>Follow-up</th>
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<tbody>
<tr>
<td><strong>Gardening frequency (times/week)</strong></td>
<td>3.3</td>
<td>0.0,6.1</td>
<td>7.6</td>
<td>5.5,9.5</td>
</tr>
<tr>
<td>Paired t-test shows significant difference between baseline and midpoint (p=.004)</td>
<td></td>
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<tr>
<td><strong>Fruit &amp; Vegetable Servings (per day)</strong></td>
<td>2.9</td>
<td>2.3,3.6</td>
<td>3.1</td>
<td>2.3,3.8</td>
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<tr>
<td>Difference nonsignificant</td>
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Future Work & Dissemination

- Final Data Collection Questionnaire
- Data Analysis to explore what knowledge, self-efficacy, and other intervention factors have impact on outcomes
- Dissemination Efforts:
  - Community dissemination to chapters
  - Extension materials for further dissemination
  - Technical report for area cooperative extension agents
  - Publication and presentation in a variety of Navajo Nation and additional national conferences
Acknowledgements

• USDA for the funding to Diné College’s Science Faculty and Land Grant Office, and to New Mexico State University as a collaborator
• The Navajo Nation Human Research Review Board for approval of the research and input on the questionnaire
• NMSU IRB for research approval for the collaborating institution
• New Dawn for Donation of Seeds for Incentives
• Chapters (Shiprock, Hogback, Lukachukai, Tsaile/Wheatfields) for approval and participation
• Student research assistants in the Diné College Summer Research Enhancement and NMSU Bridges Program