Implementing a Multi-Component Intervention to Reduce Hypertension Through DASH Diet Congregate Meals and SMBP at Two NYC Senior Centers

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Background
Cardiovascular Disease (CVD) is highly prevalent among older adults - two-thirds of adults aged 60 to 79 have one or more forms of CVD \([2]\). Racial and ethnic minorities and people of lower socioeconomic status face higher rates of CVD and mortality \([2]\). Older adults are also at increased risk for developing high blood pressure (BP), a major modifiable risk factor for CVD \([3]\). Seniors affected by financial need, food insecurity, or social isolation rely on agencies like Carter Burden Network (CBN) for community nutrition services such as congregate meals, subsidized by NYC Department of Aging: The Rockefeller University (RU) Clinical Directors Network (CDNS), and CBN formed a community/academic partnership in 2016 to address nutrition needs served among CBN clients, such as widespread high/uncontrolled BP.

Methodology
Primary Aim: Test whether providing DASH-aligned menus in an ongoing congregate meal program, and educational and behavioral support for Self-Measured Blood Pressure (SMBP) monitoring, lowers blood pressure among community-living seniors attending two senior centers in New York City.

Co-Primary Outcomes: Change in Mean Systolic BP at Month 1 vs. Baseline, and percentage of participants with JNC-8 defined "controlled" BP.

Other Aims: Adapt and implement DASH-aligned congregate meals; Optimize client acceptance; Support cognitive and behavioral change; Enhance self-efficacy for BP management; Leverage and grow a sustainable, multi-stakeholder partnership; Enhance the value of minimalistic programs.

Other Measures: DASH concordance of meals, Meal Satisfaction, Meal Attendance, Health and Psychosocial Surveys, Plate-Waste, SMBP data.

Participants: Age > 60, community-living seniors. Setting: 2 CBN Senior Centers in Harlem and the Upper East Side serving congregate meals.

Reaching: Proportion & representativeness of individuals willing to participate

Of 207 clients at the two sites, 111 were screened, 96 were eligible and 94 signed informed consent. 84 completed baseline surveys. 75% of those enrolled completed the study. The racial make-up of the study cohort was similar to that of the NYC population (Figure 1).

Figure 1: Race of Study Participants compared to New York City Census

<table>
<thead>
<tr>
<th>Race</th>
<th>Study Participation</th>
<th>NYC Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>41%</td>
<td>47%</td>
</tr>
<tr>
<td>Black</td>
<td>24%</td>
<td>30%</td>
</tr>
<tr>
<td>Indian/Alaskan Native</td>
<td>10%</td>
<td>3%</td>
</tr>
<tr>
<td>Multiple Races</td>
<td>6%</td>
<td>1%</td>
</tr>
</tbody>
</table>

Effectiveness: Impact of intervention

The interventions lowered BP at Month 3 and at end-of-study (Months 5/6) imrpovements:

- Change in mean systolic BP at Month 1 was -4.41 mmHg (p<0.001) vs. Baseline
- Women (n=48) and Black participants (n=15, 69%) were more likely to be in the group who continued SMBP to End of Study (p<0.002, p=0.077)

**Table 3: DASH Congregate Meals – As Designed vs. As Served**

<table>
<thead>
<tr>
<th>Design</th>
<th>As Designed</th>
<th>As Served</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium, mg</td>
<td>810</td>
<td>1000</td>
</tr>
<tr>
<td>Potassium, mg</td>
<td>1430</td>
<td>1000</td>
</tr>
<tr>
<td>Calcium, mg</td>
<td>400</td>
<td>400</td>
</tr>
<tr>
<td>Total Fat, g</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td>Saturated Fat, g</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Cholesterol, mg</td>
<td>300</td>
<td>300</td>
</tr>
</tbody>
</table>

**Findings: RE-AIM**

**Effectiveness:** Impact of intervention

- BMI and Baseline BP were correlated with lowering BP during study (Table 2). Other Aims: Adoption and Dissemination: The percentage of participants with JNC-8 defined "controlled" BP increased by 15.7%.
- Change in mean systolic SMBP at Months 5/6 was -6.9 mmHg (p=0.004) vs. Baseline.

**Adoption:** Number of settings willing to initiate program, value proposition

- RU-CBN-CRN leveraged their 7-year partnership to engage two sites, secure and share federal funding, and to develop the project, protocol interventions in collaboration.
- Engagement with NYC Dept for the Aging during implementation facilitated approval and for adopting changes to existing programs.

**Implementation:** Fidelity to the intervention, adaptations

- Menus adjusted to respond to participant feedback in 1st week
- COVID interrupted congregate meals Month 3 (Site 1), and Month 6 (Site 2)

**Conclusions**

- It is feasible to implement DASH-aligned meals through an existing congregate meal program along with SMBP at NYC senior centers. Enrollment was locally representative. Black women were more likely to continue SMBP.
- Encouraging BP reduction demonstrated. Study may underestimate longer-term effects of program and sustainability.

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