Feasibility of mobile technology for monitoring dietary intake in resource-limited communities: Investigating digital food records in the CV Health and Needs Assessment in Washington, D.C

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Mobile Health Technologies May Reach Low SES Communities Outside The Clinical Setting

- Less is understood about incorporating mHealth technology in community-based interventions

- Need to account for resource limitations when using technology in community-based interventions

Asch DA et al, NEJM 2012; Burke LE, et al., AJPM 2012; Cortez NG, et al. NEJM; Bennett GG, et al. Obesity Reviews
OBJECTIVE:

To evaluate the feasibility of a digital food record among church-based populations in resource-limited Washington, D.C. wards.
Participants (n=18) from churches in Wards 5, 7, and 8

Photo-documented 3-day dietary intake using a digital food record on a Wi-Fi-dependent, mobile device
Less physical activity across DC wards trends with higher obesity rates.

**Median Household Income ($/year):**
- Ward 5: $53,000
- Ward 7: $39,000
- Ward 8: $30,000
- Washington, DC: $66,000

**Educational Attainment in Washington, D.C.**

<table>
<thead>
<tr>
<th>Ward</th>
<th>Percent of population 25 years and older</th>
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<tbody>
<tr>
<td>Ward 1</td>
<td>55%</td>
</tr>
<tr>
<td>Ward 2</td>
<td>73%</td>
</tr>
<tr>
<td>Ward 3</td>
<td>82%</td>
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<tr>
<td>Ward 4</td>
<td>41%</td>
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<tr>
<td>Ward 5</td>
<td>29%</td>
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<tr>
<td>Ward 6</td>
<td>57%</td>
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<tr>
<td>Ward 7</td>
<td>17%</td>
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<tr>
<td>Ward 8</td>
<td>10%</td>
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<tr>
<td>District Wide</td>
<td>47%</td>
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</tbody>
</table>

Participants Received an Instruction Manual and Device With Pre-loaded App

Cardiovascular Health and Needs Assessment in Washington D.C.

FitNinja Instruction Manual

FitNinja is a mobile app (program) that lets you record your meals throughout the day. You will use the FitNinja for two separate assignments.

1. You will be required to use FitNinja to keep a 3-day detailed food record. You will need to take a picture of all of your food items before you begin your meal/snack and a picture of any remaining food items after you finish your meal/snack. For each meal/snack, you should have at least two pictures. You should take pictures of your meals for at least 3 days in a row (with a least one weekend day and two weekdays).

2. You can also use FitNinja to log your meals for the duration of the study.

3. You will need Wi-Fi connectivity to use FitNinja.
Participants Had Several Additional Options for Logging Their Meals
Digital Food Record On Wi-fi-Dependent Device

Secure, Server HIPAA Compliant

Internet

Wi-Fi

NHLBI Researcher
FEASIBILITY:

Successfully capturing before and after images for at least two meals (i.e. breakfast, lunch, dinner, or snack) on three days
Most Participants Photo-Documented Their Meals

Average # Logged Meals/Day = 2.8 ± 0.8
Over Half Captured At Least One Photo For 2 Meals/Day For 3 Days
Few Participants Captured Meal Data as Directed

(i.e. before AND after photos for 2 meals/day for 3 days)
Participants Typically Captured ‘Before’ Photos and Forgot ‘After’ Photos

Dinner - "For dinner I am eating a veggie burger"
Participants Typically Captured ‘Before’ Photos and Forgot ‘After’ Photos

Lunch - "basil pesto chicken and chili"
Photo Quality Varied Across Participants

Good Quality

Poor Quality
Meal Categorization was an Issue for Some Participants
Conclusions

- Most participants photo-documented their meals for the required 3 days.
- However, they were less successful at including BOTH before and after meal photos.

Implementing digital food records specifically requires training or reminders on the importance of before and after photos to ensure greater accuracy in dietary intake data.
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Questions?

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