Impacts of a computer and Internet skills training program on communication and social connectedness among low-income older adults

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Northern Illinois University
APHA Annual Meeting, November 17, 2014

Background
- Social network decrease with aging
- Internet’s potential to enhance social, psychological, and physical well-being of older adults
- Digital divide
  - Less use and narrower scope of computer and Internet use among older adults
  - Digital divide within older adults
- Inconclusive regarding intervention programs’ impact on social connectedness among older adults
- Most studies done with highly educated, middle-class, white populations

Presenter Disclosure
Jinsook Kim
No relationships to disclose

Digital Divide within Older Adults
Discrepancies in computer and Internet use by
- Age
  - Younger > older
- Socioeconomic status
  - Lower income < higher income
  - Less education < more education
- Race/ethnicity
  - Hispanic < African American < White
- Gender
  - Historically male > female, now similar

Impacts of Training on Usage
- The majority continuing to use the Internet and email on a weekly basis (White et al., 2002)
- Increase in Internet and email use (Woodward et al., 2011)
- Email use among 80% of intervention participants (Grad & Berdes, 2005)
- More regular email use among participants in older adult-specific training than those in generic training (Lawton, 2001)

Impacts of Training on Social Networks
- Training -> Increased use -> Improved social networks?
  - Reduced loneliness in a meta-analysis (Choi et al., 2012)
  - Increase in perceived social support (Woodward et al., 2011)
  - Decreased loneliness (Shapira et al., 2007)
  - No effect on social network development (Slegers et al., 2008)
Study Aims

• Examine whether participation in a computer and Internet skills training influences
  – Primary modes of communication
  – Frequency of Internet use
  – Extent of social networks among low-income older adults
• Examine whether the changes in the extent of social networks vary by demographic and other factors

Methods

• Study design
  – One-group pre-and-post design
• Using data collected before and after a 6-week computer and Internet skills training program
  – Part of a comprehensive sustained Internet use promotion program
• Sample
  – Low-income older adults (age 65 to 91) living in public and Section 8 senior housing facilities

Intervention

• Computer learning center and Wi-Fi in communal spaces
• Computer and Internet skills training
• Staffed by a community program manager
• Free broadband service available for 1 year upon training completion
• Receipt of a free laptop computer at training completion

Instrument

Hard-copy self-administered questionnaire including

• Demographic characteristics
• Communication modes in 4 categories
• Frequency of Internet use in 6 categories
• Abbreviated version of Lubben Social Network Scale (LSNS-6) to measure the extent of social networks (Lubben & Gironda, 2000)

Lubben Social Network Scale (LSNS-6)

• Total 6 questions on
  – “the number of each relatives and friends one ...”
    • “sees or hears from at least once per month.”
    • “feels close enough to call on for help.”
    • “feels at ease enough to talk about private matters.”
• Six-point Likert-type response
  0 = none
  1 = one
  2 = two
  3 = three or four
  4 = five through eight
  5 = nine or more
• Sum of 6 item scores (ranging from 0 to 30) = the extent of overall social networks (Lubben et al., 2006)

Analysis

• Sample characteristics and distributions of 3 main outcomes at each pretest and posttest
  – Using means, percentages, t-tests, ANOVA, and Fischer’s exact tests
• Pre-post difference in outcomes
  – Using paired t-tests, Sign tests, and Fischer’s exact tests
• Variation in pre-post changes in LSNS-6
  – Using t-tests, ANOVA, and linear regression
Results: Sample Characteristics (1)

<table>
<thead>
<tr>
<th></th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender (n=76)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>49</td>
<td>64.5</td>
</tr>
<tr>
<td>Male</td>
<td>27</td>
<td>35.5</td>
</tr>
<tr>
<td>Race (n=77)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>58</td>
<td>75.3</td>
</tr>
<tr>
<td>African American</td>
<td>19</td>
<td>24.7</td>
</tr>
<tr>
<td>Age (n=77)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>65-69</td>
<td>26</td>
<td>33.8</td>
</tr>
<tr>
<td>70-79</td>
<td>33</td>
<td>42.9</td>
</tr>
<tr>
<td>80+</td>
<td>18</td>
<td>23.4</td>
</tr>
</tbody>
</table>

Results: Sample Characteristics (2)

<table>
<thead>
<tr>
<th></th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education (n=77)</td>
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<td></td>
</tr>
<tr>
<td>&lt; High School</td>
<td>29</td>
<td>37.7</td>
</tr>
<tr>
<td>High school/GED</td>
<td>22</td>
<td>28.6</td>
</tr>
<tr>
<td>Some college+</td>
<td>26</td>
<td>33.8</td>
</tr>
<tr>
<td>Income (n=69)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; $5,000</td>
<td>19</td>
<td>27.5</td>
</tr>
<tr>
<td>$5,001+</td>
<td>9</td>
<td>13.0</td>
</tr>
</tbody>
</table>

Results: Distribution of Outcomes

- Communication mode, Internet use frequency, and the extent of social networks (LSNS-6)
  - Similar across demographic groups at pretest & posttest
  - Exception: LSNS-6 difference by gender
    - At pretest, women (16.9) > men (13.1), p < .05
    - At posttest, women (20.7) > men (17.8), p < .01
- Social networks (LSNS-6)
  - No difference by communication mode or Internet use frequency
  - Exception: difference by Internet use frequency
    - At posttest, moderate users (22.1) > frequent users (19.6) > rare users (15.0), p < .01

LSNS-6 Score of Internet Use Groups

![LSNS-6 Score of Internet Use Groups](image)

Figure 1. LSNS-6 score of 3 Internet use groups (per frequency) at posttest

Results: Pre-Post Differences

<table>
<thead>
<tr>
<th></th>
<th>Pretest</th>
<th>Posttest</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication mode (n=73)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Face-to-face</td>
<td>45.2%</td>
<td>20.5%</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Mail</td>
<td>9.6%</td>
<td>4.1%</td>
<td></td>
</tr>
<tr>
<td>Phone</td>
<td>39.7%</td>
<td>32.9%</td>
<td></td>
</tr>
<tr>
<td>Email/Internet</td>
<td>5.5%</td>
<td>42.5%</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>Internet use frequency (n=59)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rare</td>
<td>37.3%</td>
<td>8.5%</td>
<td></td>
</tr>
<tr>
<td>Moderate</td>
<td>22.0%</td>
<td>44.1%</td>
<td></td>
</tr>
<tr>
<td>Frequent</td>
<td>40.7%</td>
<td>47.4%</td>
<td>&lt; 0.0001</td>
</tr>
<tr>
<td>LSNS-6 total score (n=72)</td>
<td>15.6 (0.7)</td>
<td>19.7 (0.5)</td>
<td>&lt; 0.0001</td>
</tr>
</tbody>
</table>

1 From a Fisher's exact test; 2 From a Sign test; 3 From a paired t-test

Communication Mode at Pre & Post

![Communication Mode at Pre & Post](image)

Figure 2. Primary mode of communication at pretest and posttest in percentages
Summary

- The primary mode of communication shifted from more traditional (face-to-face & mail) to digital means (email or Internet).
- The frequency of Internet use increased.
- The extent of social networks improved.
  - Similar improvement across groups regardless of demography, primary communication mode, and Internet use frequency
  - Significantly greater improvement among African Americans

Discussion

- Comparatively more improvement in the extent of social networks among African Americans
  - may indicate greater benefits of interventions on population groups of disadvantaged background
- Moderate Internet users with the highest LSNS-6 score, followed by frequent users and rare users at posttest
  - could be factors correlated with greater social networks among moderate users
- Limitations in study design, instrument, and sample size

Results: Pre-Post Changes in LSNS-6 (1)

<table>
<thead>
<tr>
<th>Gender</th>
<th>n</th>
<th>Mean (s.d.)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>46</td>
<td>3.9 (2.6)</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>25</td>
<td>4.7 (2.5)</td>
<td>0.21</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>65-69</td>
<td>24</td>
<td>4.5 (2.2)</td>
<td></td>
</tr>
<tr>
<td>70-79</td>
<td>32</td>
<td>3.8 (3.1)</td>
<td></td>
</tr>
<tr>
<td>80+</td>
<td>16</td>
<td>4.1 (1.8)</td>
<td>0.65</td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>54</td>
<td>3.7 (2.1)</td>
<td></td>
</tr>
<tr>
<td>African American</td>
<td>18</td>
<td>5.2 (3.5)</td>
<td>0.03</td>
</tr>
</tbody>
</table>

1From a t-test comparing means of 2 groups
2From analysis of variance comparing means of more than 2 groups

Results: Pre-Post Changes in LSNS-6 (2)

<table>
<thead>
<tr>
<th>Education</th>
<th>n</th>
<th>Mean (s.d.)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; High school</td>
<td>28</td>
<td>4.2 (2.8)</td>
<td></td>
</tr>
<tr>
<td>High school/GED</td>
<td>21</td>
<td>3.7 (2.1)</td>
<td></td>
</tr>
<tr>
<td>Some college+</td>
<td>23</td>
<td>4.3 (2.8)</td>
<td>0.71</td>
</tr>
<tr>
<td>Income</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; $5,000</td>
<td>17</td>
<td>4.9 (3.3)</td>
<td></td>
</tr>
<tr>
<td>$5,000 - $15,000</td>
<td>39</td>
<td>4.2 (2.4)</td>
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<tr>
<td>$15,001+</td>
<td>9</td>
<td>2.7 (2.0)</td>
<td>0.12</td>
</tr>
</tbody>
</table>

1From analysis of variance comparing means of more than 2 groups
Future Research & Practice Directions

• Test programs with a larger sample of disadvantaged participants and more longitudinal time points

• Further examine how the extent and types of Internet use influence social networks

• Compare programs with different components (in curriculum, service, equipment, etc.)
  – Test which components are associated with improvements in Internet use and social networks

References


