Using Personalized Education Delivery to Improve Community Clinic Patients’ Knowledge of Hypertension

Special Libraries Association Annual Meeting
Biomedical & Life Sciences Division
June 11, 2013

Taneya Y. Koonce, MSLS, MPH, Associate Director for Research, Knowledge Management/Eskind Biomedical Library, Vanderbilt University Medical Center, Nashville, TN. Nunzia B. Giuse, MD, MLS, Assistant Vice Chancellor for Knowledge Management; Director of the Eskind Biomedical Library; Knowledge Management & Eskind Biomedical Library, Vanderbilt University Medical Center, Nashville, TN. Songphan Choemprayong, PhD, Lecturer, Chulalongkorn University, Bangkok, Thailand. Suzanne Hurley, RN, MSN, APRN-BC, Clinical Director for Community Health Services; University Community Health Services, Nashville, TN. Sandra L. Martin, Ed.D., MLS, Nashville, TN. Marcia Epelbaum, M.A., Assistant Director, Eskind Biomedical Library, Vanderbilt University Medical Center, Nashville, TN. Sheila V. Kusnoor, PhD, Health Knowledge Information Scientist, Knowledge Management/Eskind Biomedical Library, Vanderbilt University Medical Center, Nashville, TN.
Overview

• Multi-phase plan of research agenda
• Care services at community health clinics
• Study design and methodology
• Results & implications
• Summary & conclusion

Wordle created at http://www.wordle.net
Research Phases

**Phase I**
(n=209)

- Impact of health literacy & learning-style tailored educational material on *hypertension* knowledge
- Design & Setting: two randomized trials in an *emergency department*

**Phase II**
(n=186)

- Impact of health literacy & learning-style tailored educational material on *hypertension* knowledge
- Design & Setting: randomized trial in a *community health center*

**Phase III**
(n=160)

- Impact of health literacy & learning-style tailored educational material on *diabetes* knowledge
- Design & Setting: randomized trial in a *community health center*

Community Health Centers/Clinics

Provide critical, safety-net care for low-income, medically underserved communities

Medically underserved populations have increased risk for preventable, chronic disease

Incidence of hypertension in community health center settings is almost 3x as high as in primary care offices.

Vine Hill Community Clinic

• Community health center that provides primary and preventive care services to Nashville’s low-income & medically underserved communities

• Operated by the Vanderbilt School of Nursing

• Clinic network snapshot
  o 27,000+ visits annually
  o 50% of all patients are uninsured; another 35% receive Medicaid program benefits
  o 90% of all patients are at or below the 100% poverty level
  o Hypertension affects 22% of the clinic network population
Study Design

Patient Eligibility Criteria

- 18 years and older
- speak English and/or Spanish
- clinician hypertension diagnosis
- exclusion criteria: illiteracy, cognitive impairment, psychiatric reason for clinic visit

Baseline Data Collection

- age, gender, race, ethnicity, level of education, employment status, household income, smoking status, personal and family history of high blood pressure, use of hypertension medications
Measures

• **Hypertension knowledge**
  - 16-item test to understand patients’ knowledge of high blood pressure

• **Health literacy**
  - 3 questions assessing confidence filling out medical forms, frequency with which help is needed reading hospital materials, and how often patients had problems learning about medical conditions

• **Learning style preferences**
  - Each participant indicated their preference for visual, aural, read/write, and kinesthetic modalities

---

Intervention & Follow-Up

**Intervention Materials**
- Targeted to 5th and 8th grade level
- Available in four different formats
- Information professionals reviewed material with patient in-clinic

**Usual Care Group**
- Received materials after study completion

**Follow Up Assessment**
- Same hypertension knowledge questionnaire administered *two weeks and six weeks* after clinic visit
- Questions ascertaining level of satisfaction with material; to what extent they looked up information on their own
Patient Flowchart

Initial enrollment (n=186)

Randomization

Allocated to control (n=90)
- Lost at two-week follow up (n=23)
  - Analyzed at two-week follow up (n=67)
    - Lost at six-week follow up (n=6)
      - Analyzed at six-week follow up (n=61)

Allocated to intervention (n=96)
- Lost at two-week follow up (n=16)
  - Analyzed at two-week follow up (n=80)
    - Lost at six-week follow up (n=12)
      - Analyzed at six-week follow up (n=68)
Hypertension Quiz Results

Absolute change in the mean number of correct responses on the hypertension quiz

<table>
<thead>
<tr>
<th></th>
<th>Control</th>
<th>Intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline</td>
<td>n=90</td>
<td>n=96</td>
</tr>
<tr>
<td></td>
<td>7.3</td>
<td>7.8</td>
</tr>
<tr>
<td>2 week</td>
<td>n=67</td>
<td>n=80</td>
</tr>
<tr>
<td>follow up</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>7.8</td>
<td>10</td>
</tr>
<tr>
<td>6 week</td>
<td>n=61</td>
<td>n=68</td>
</tr>
<tr>
<td>follow up</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>8.3</td>
<td>10</td>
</tr>
</tbody>
</table>
## Multivariate Analysis Highlights

<table>
<thead>
<tr>
<th>Variable</th>
<th>Hypertension post-test score</th>
<th></th>
<th></th>
<th>Mixed effect model (n=289)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2-week (n=147)</td>
<td>6-week (n=129)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>B (SE)</td>
<td>B (SE)</td>
<td>B (SE)</td>
<td></td>
</tr>
<tr>
<td>Intercept</td>
<td>-0.04 (1.33)</td>
<td>1.31 (1.53)</td>
<td>7.80** (1.37)</td>
<td></td>
</tr>
<tr>
<td>Baseline quiz score</td>
<td>0.61** (0.07)</td>
<td>0.44** (0.07)</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Intervention group</td>
<td>2.09** (0.50)</td>
<td>3.14** (0.79)</td>
<td>0.71 (0.48)</td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>0.04 (0.38)</td>
<td>-0.73 (0.38)</td>
<td>-0.49 (0.49)</td>
<td></td>
</tr>
<tr>
<td>Non-white race</td>
<td>-0.01 (0.37)</td>
<td>-0.66 (0.36)</td>
<td>-0.58 (0.45)</td>
<td></td>
</tr>
<tr>
<td>Chew score(^2)</td>
<td>-0.02 (0.06)</td>
<td>0.00 (0.06)</td>
<td>-0.16* (0.07)</td>
<td></td>
</tr>
<tr>
<td>Multimodal learning style (vs. single)</td>
<td>0.35 (0.37)</td>
<td>0.51 (0.35)</td>
<td>-0.55 (0.45)</td>
<td></td>
</tr>
<tr>
<td>More than high school education</td>
<td>0.88* (0.36)</td>
<td>1.11* (0.35)</td>
<td>1.62* (0.45)</td>
<td></td>
</tr>
<tr>
<td>Household income higher than $20,000</td>
<td>0.28 (0.36)</td>
<td>0.38 (0.34)</td>
<td>0.38 (0.44)</td>
<td></td>
</tr>
<tr>
<td>Interviewer #2</td>
<td>1.98 (1.13)</td>
<td>3.69 * (1.49)</td>
<td>0.32 (0.45)</td>
<td></td>
</tr>
<tr>
<td>Interviewer #3</td>
<td>1.05 (1.89)</td>
<td>2.16 (1.64)</td>
<td>-0.91* (0.43)</td>
<td></td>
</tr>
<tr>
<td>Interviewer #4</td>
<td>3.31 (4.35)</td>
<td>-2.24 * (0.99)</td>
<td>3.73* (1.83)</td>
<td></td>
</tr>
<tr>
<td>Interviewer #5</td>
<td>-0.13 (0.42)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interviewer #6</td>
<td>0.45 (1.19)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intervention group X Interviewer #2</td>
<td>-1.05 (0.69)</td>
<td>-2.52 * (0.89)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intervention group X Interviewer #3</td>
<td>-1.47 (1.30)</td>
<td>-2.24 * (0.99)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intervention group X Interviewer #4</td>
<td>-1.27 (2.51)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time (2-week)</td>
<td>0.91 (0.78)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time (6-week)</td>
<td>0.10 (0.79)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intervention group X Time (2-week)</td>
<td>1.27* (0.46)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intervention group X Time (6-week)</td>
<td>0.96* (0.47)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: * p (2-tailed) < .05. ** p (2-tailed) < .001

\(^1\) Completed data only (no imputation was applied)

\(^2\) Scored on an inverse scale; the lower the Chew score, the higher the health literacy.
Summary & Conclusion

• Chronic disease management in medically underserved communities requires providers to overcome a myriad of challenges.

• Novel approaches to increase knowledge and promote higher levels of patient engagement can provide effective strategies for improving overall healthcare delivery.

• Key to the project was the team’s expertise in:
  o information science
  o education and training
  o content and knowledge understanding of the medical field
  o excellent customer service skills

The initiative reported in this paper clearly demonstrates the important added value a team of experienced and skilled medical librarians could have in helping in any outreach efforts aimed at educating a diverse population with multiple health literacy and learning style needs.