Health Literacy and Management of Chronic Conditions in Ethnic/Linguistic Minority Groups

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Health Literacy

Definition

“The degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions.”

What are the established facts?

- People with low educational levels, the elderly, the disabled, and first generation immigrants whose primary language is not English, are among the most venerable groups affected by low health literacy.
Unclear or Unknown

Nature of health literacy (HL)

Is it “knowledge” or “skill”, or hybrid of both?

Underlying mechanism of HL

How it is related to other constructs in healthcare research (e.g., directly or indirectly?)
Consequences of Unknowns

In spite of the important role of health literacy in the management of chronic conditions:

- Few intervention studies on improving HL directly
- Difficulties with identifying barriers to improve HL as a means of improving chronic condition management
Conceptual Framework per AHRQ’s HL Definition

Self Care skills
- Disease management skills
  (Adherence to treatment regimen: medication, behavioral-exercise, diet & stress management)

Capacity
Health Literacy

Skills
App. Health Decision

Health Care Service Utilization
- System navigation skills
- Insurance management skills
- Provider-patient communication
- Improve knowledge

Individual Characteristics
- Ethnicity
- Education
- Age
- Gender
- Disease severity

Health Outcomes
- HBP control
- Glucose control
- Quality of Life
2 HL Focused Clinical Trials (1)

**Hypertension Control**

- Korean American (KA) elderly with HBP \( (n=369) \)
- 2006 – 2012 (NHLBI)
- Intervention (18 months)
  - 6 weeks (12 hours) didactic education
  - Monthly motivational telephone counseling by RNs
  - BP home monitoring with monthly summary reports

**Diabetes Management**

- KA adults with type 2 diabetes \( (n=250) \)
- 2009 – 2014 (NIDDK)
- Intervention (12 months)
  - 6 weeks (12 hours) didactic education
  - Monthly motivational telephone counseling by RNs/CHWs
  - Dry blood sugar monitoring & diary
Implementing Strategy
Use CBPR approach with community partner (Korean Resource Center)

- **Mission**: To reduce health disparity & to improve quality of life in the Korean American community
- Established in 2001 by researchers and community leaders in BW region; not affiliated with universities/hospital/public agency and programmatically and financially independent
- Focusing on research and education on health promotion in the KA community, esp. hypertension, diabetes, depression, smoking, health insurance management
Benefit to working with community partner (KRC)

- Strong rapport with KA community (ethnic churches, KA organizations, and local/ethnic media)
- Collaboration with state/local health departments through coalitions & committees
- Capable of carrying out (behavioral intervention) clinical trials based on CBPR & self-help (planning, administration, recruitment/retention & evaluation)
- Performance:
  - Nine intervention and 12 dissemination projects
  - CHWs trained: 54
  - More than 30 peer-reviewed articles; 253 presentations to the KA community & outreach to more than 35,000 KAs in the region
CONSORT

Hypertension Study

Eligibility Screening at 17 churches & 3 senior centers (n=632)

Baseline Enrollment (n=440)

Excluded (n=192)
- Ineligible (158)
- Refusal/“Not interested” (25)
- “I can control myself.” (3)
- Schedule conflict (4)
- No telephone (2)

Intervention Group (n=225)
- 2 hours/6 weeks training
- Home BP monitoring
- Monthly telephone counseling

Drop (n=38):
- Refuse classroom education (15)
- Incomplete education (16)
- No home BP transmission (3)
- No telephone counseling (3)

Control Group (n=215)
- Delayed intervention after 18 months

Drop (n=23):
- Return to Korea (3)
- Refusal (18)
- Lost contact (2)

Month 6 (n=191)
- Home BP monitoring
- Monthly telephone counseling

Month 6 (n=192)

Drop (n=7):
- Deceased (2)
- Refusal (2); Moving out (1)
- Sick (2; brain tumor, stroke)

Month 12 (n=187)

Drop (n=3):
- Deceased with fire (1); lung cancer (1)
- Refusal (1)

Month 12 (n=185)

No Drop

Month 18 (n=184)

Month 18 (n=185)

Diabetes Study

Outreach (n=4,457)
- 32 Churches (n=1,986)
- 86 outreach to a supermarket (n=2,414)
- 2 outreach to trade assoc. meetings (n=57)

Call/Walk in: Having DM/on DM medication (n=189)

Screened (n=597)
- Ineligible (A1c<6.8) (263)
- Spouse already enrolled (2)
- Refuse to give personal info (3)
- No ride (2); In other program (1)
- Out of contact (2)
- Dementia (2); Sick (2)
- Too busy (3)
- Mission trip/travel (2)
- Refuse (12)

Monthly telephone counseling

Multimodal Care Group (n=120)
- 6 weeks in-class training (12 hours)
- Home glucose monitoring

Drop (n=4):
- Too busy (3)
- Got enough (1)

Usual Care Group (n=130)
- Delayed intervention after month12

Drop (n=17):
- Visting Korea (2)
- Too busy (4)
- No ride (2)
- Language issue (1)
- Family/cancer (1)
- Refuse (6)

Drop (n=5):
- Lymphoma (1)
- Too busy (2)
- Refuse (1)
- Mental issue (1)

Drop (n=2):
- Cancer (1)
- Refuse (1)
# Results

## Hypertension Study

### Demographics

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Intervention (n = 184)</th>
<th>Control (n = 185)</th>
<th>Total (n = 369)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age, years, mean (SD)</strong></td>
<td>70.6 (5.0)</td>
<td>71.2 (5.6)</td>
<td>70.9 (5.3)</td>
<td>0.290</td>
</tr>
<tr>
<td>≤69, n (%)</td>
<td>79 (42.9)</td>
<td>76 (41.1)</td>
<td>155 (42.0)</td>
<td></td>
</tr>
<tr>
<td>70–79, n (%)</td>
<td>97 (52.7)</td>
<td>93 (50.3)</td>
<td>190 (51.5)</td>
<td></td>
</tr>
<tr>
<td>≥80, n (%)</td>
<td>8 (4.3)</td>
<td>16 (8.6)</td>
<td>24 (6.5)</td>
<td></td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
<td></td>
<td>0.291</td>
</tr>
<tr>
<td>Male, n (%)</td>
<td>60 (32.6)</td>
<td>51 (27.6)</td>
<td>111 (30.1)</td>
<td></td>
</tr>
<tr>
<td>Female, n (%)</td>
<td>124 (67.4)</td>
<td>134 (72.4)</td>
<td>258 (69.9)</td>
<td></td>
</tr>
<tr>
<td><strong>SBP, mmHg (mean (SD))</strong></td>
<td>141 (17)</td>
<td>140 (20)</td>
<td>141 (19)</td>
<td>0.688</td>
</tr>
<tr>
<td><strong>DBP, mmHg (mean (SD))</strong></td>
<td>79 (11)</td>
<td>79 (11)</td>
<td>79 (11)</td>
<td>0.909</td>
</tr>
<tr>
<td><strong>BMI, kg/m² (mean (SD))</strong></td>
<td>25.5 (3.2)</td>
<td>25.7 (3.3)</td>
<td>25.6 (3.2)</td>
<td>0.704</td>
</tr>
<tr>
<td><strong>Education, years (mean (SD))</strong></td>
<td>11.2 (4.2)</td>
<td>11.1 (4.4)</td>
<td>11.2 (4.3)</td>
<td>0.728</td>
</tr>
<tr>
<td>≤Middle school graduate, n (%)</td>
<td>68 (37.0)</td>
<td>70 (37.8)</td>
<td>138 (37.4)</td>
<td></td>
</tr>
<tr>
<td>High school graduate, n (%)</td>
<td>54 (29.3)</td>
<td>50 (27.0)</td>
<td>104 (28.2)</td>
<td></td>
</tr>
<tr>
<td>≥Some college, n (%)</td>
<td>62 (33.7)</td>
<td>65 (35.1)</td>
<td>127 (34.4)</td>
<td></td>
</tr>
<tr>
<td><strong>Living in U.S., years (mean (SD))</strong></td>
<td>25.6 (10.5)</td>
<td>24.4 (11.5)</td>
<td>25.0 (11.0)</td>
<td>0.297</td>
</tr>
</tbody>
</table>
## Results

### Demographics

| Characteristics                  | Intervention Group (IG) (n=120) | Control Group (CG) (n = 130) | Total (n=250) | \( p \) (|IG|>|CG|) |
|----------------------------------|--------------------------------|-----------------------------|---------------|-----------------|
| Age, years (SD)                  | 59.5 (8.38)                    | 58.2 (8.47)                 | 58.9 (8.44)   | 0.229           |
| Male, n (%)                      | 68 (56.7%)                     | 74 (56.9%)                  | 142 (56.8%)   | 0.999           |
| Married, n (%)                   | 110 (91.7%)                    | 114 (87.7%)                 | 224 (89.6%)   | 0.304           |
| Family size, persons (SD)        | 3.0 (1.21)                     | 3.0 (1.23)                  | 3.0 (1.22)    | 0.642           |
| Working: full/part time (%)      | 61 (51.3%)                     | 87 (67.4%)                  | 148 (59.7%)   | 0.010           |
| Years in USA (SD)                | 24.2 (10.9)                    | 23.3 (11.3)                 | 23.7 (11.1)   | 0.491           |
| Education, years (SD)            | 13.4 (3.08)                    | 13.2 (3.36)                 | 13.3 (3.22)   | 0.633           |
| Housing own, n (%)               | 80 (66.7%)                     | 80 (61.5%)                  | 160 (64.0%)   | 0.913           |
| Comfortable living/OK, n (%)     | 79 (66.4%)                     | 90 (69.8%)                  | 169 (68.1%)   | 0.588           |
| Monthly income, $ (SD)           | $3,702 ($3,177)                | $4,735 ($9,527)             | $4,269 ($7,379) | 0.311         |
| No health insurance, n (%)       | 52 (43.3%)                     | 67 (51.5%)                  | 119 (47.6%)   | 0.207           |
| Have a primary doctor, n (%)     |                                |                             |               |                 |
| Not have one                     | 35 (29.2%)                     | 37 (29.2%)                  | 72 (28.8%)    |                 |
| Korean speaking doctor           | 72 (60.0%)                     | 78 (60.0%)                  | 150 (60.0%)   | 0.981           |
| Non-Korean speaking doctor       | 13 (10.8%)                     | 15 (11.5%)                  | 28 (11.2%)    |                 |
Results: Primary Outcome (HBP)

<table>
<thead>
<tr>
<th></th>
<th>Baseline</th>
<th>6 month</th>
<th>12 month</th>
<th>18 month</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Controlled BP, n (%)</strong></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intervention</td>
<td>91 (49.5%)</td>
<td>107 (58.5%)</td>
<td>125 (67.9%)</td>
<td>100 (54.3%)</td>
</tr>
<tr>
<td>Control</td>
<td>80 (43.2%)</td>
<td>78 (42.2%)</td>
<td>96 (52.5%)</td>
<td>98 (53.0%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>p</th>
<th></th>
<th></th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.231</td>
<td>0.002</td>
<td>0.003</td>
<td>0.835</td>
</tr>
</tbody>
</table>
Results: Primary Outcome (DM)

Figure 2. Changes in HbA1c over time by group

- Intervention Group
  - Baseline: 9.0%
  - 3 months: 8.5%
  - 6 months: 8.3%
  - 9 months: 8.1%
  - 12 months: 7.9%

- Control Group
  - Baseline: 9.0%
  - 3 months: 8.5%
  - 6 months: 8.3%
  - 9 months: 8.1%
  - 12 months: 7.9%

Changes:
- Intervention Group:
  - 0.22%
  - -0.54%**
  - -0.62%**
  - -0.46%**
  - -0.52%**

- Control Group:
  - -0.54%**
  - -0.62%**
  - -0.46%**

Significance:
* p<0.05; ** p<0.01; *** p<0.001
Indirect effect of HL->efficacy --> a1c: -0.034 (0.011); z = -3.06, p = .002
Total effect of HL-> a1c: -0.137 (0.052); z = -2.61, p = .009
Indirect effect of HL->Diet Plan --> a1c: -.080 (.018): p<.001
Total effect of HL--> a1c: -.139 (.053): p<.001
Effect of our HL interventions

- HL intervention, which designed to specifically change health literacy level, can produce the desire outcomes (proximal and distal outcomes) in chronic disease management.

- It is not only to improve knowledge, but also to improve self-efficacy as well as communication skills - all of which are necessary for individuals, particularly the most vulnerable, to effectively manage their disease.
Role of HL in self-care

- HL influence the distal clinical outcomes indirectly through process variables (proximal outcomes) such as knowledge → self care efficacy → self care skills → outcomes
Findings suggest that health literacy serves as a missing link between individual characteristics, known psychosocial variables, and chronic disease management, especially for individuals with limited English skills such as KAls.

Interventions that influence HL directly are fruitful strategy to improve self-management skills and outcomes for people with chronic diseases.
Thank You!

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