Interventions to Improve Health Outcomes for Low Literacy Patients

Systematic Review of the Literature

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What is Health Literacy?

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

Healthy People 2010
Why is Health Literacy Important?

• High prevalence of "low health literacy"
• Low health literacy associated with:
  – less knowledge about disease
  – greater risk of hospitalization
  – lower odds of receiving preventive services
  – worse control of chronic illnesses
Literacy in America

- National Adult Literacy Survey (NALS, 1992)
  - Over 90 million Americans had inadequate functional literacy
    - Level 1 or 2 (out of 5)
    - More common among elderly, minorities, immigrants, low SES

- National Assessment of Adult Literacy (NAAL, 2003)
  - New categories
  - Prose results:

From http://nces.ed.gov/naal/
National Assessment of Adult Literacy (NAAL)

- Most up to date portrait of literacy in U.S.
- Scored on 4 levels
- Lowest 2 levels cannot:
  - Use a bus schedule or bar graph
  - Explain the difference in two types of employee benefits
  - Write a simple letter explaining an error on a bill

National Center for Education Statistics, U.S. Department of Education
Outcomes Associated with Literacy

Health Outcomes/Health Services
• General health status
• Hospitalization
• Prostate cancer stage
• Depression
• Asthma
• Diabetes control
• HIV control
• Mammography
• Pap smear
• Pneumococcal immunization
• Influenza immunization
• STD screening
• Cost

Behaviors Only
• Substance abuse
• Breastfeeding
• Behavioral problems
• Adherence to medication
• Smoking

Knowledge Only
• Birth control knowledge
• Cervical cancer screening
• Emergency department instructions
• Asthma knowledge
• Hypertension knowledge

Reducing Health Literacy Disparities

• Approaches
  – Improving literacy in the population
  – Simplifying health education materials
  – Improving patient-provider communication
  – Changing systems of health care management
Review of Intervention Studies: Methods

• Inclusion Criteria:
  – Published after 1980 in English
  – Conducted in developed country
  – Use of controlled or uncontrolled experimental design
  – More than 10 subjects
  – Direct measure of literacy among participants
  – Measure of effect on at least one health outcome

Pignone et al. J Gen Intern Med, 2004
Review of Intervention Studies: Methods

• Search in MEDLINE and CINAHL

• Keywords: literacy, reading ability, reading skill, numeracy, WRAT, wide range achievement, rapid estimate of adult, TOFHLA, test of functional health

• Total of 37 unique studies met criteria
# Results

<table>
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<tr>
<th>Category</th>
<th>Type of Intervention</th>
<th>Number of Studies</th>
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<td>Educational Materials</td>
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<td>Self-management</td>
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<td>Brief, 1-time Direct Direct Education</td>
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<td>Complex Interventions</td>
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<tr>
<td>Literacy Education</td>
<td>Adult literacy class</td>
<td>1</td>
</tr>
</tbody>
</table>
Educational Materials

18 studies

- **Written**
  - Use of pictures or graphics
  - Writing at lower grade levels
  - Easy-to-read and understand formats

- **Video**
  - Graphics, scenarios, patient and provider dramatizations

- **Computer**
  - Interactive DVD’s with self-guided components
  - Graphics, videos and self-assessments

- **Self-management**
  - Illustrative medication schedule

Images from PDA video to increase HIV knowledge and adherence

Educational Materials: Outcomes

• Positive Findings
  – Accuracy of self-breast exams
  – Increased receipt of vaccines

• Mixed Findings
  – Comprehension of medical information
  – Adherence to medications

• Negative Findings
  – A1c, BMI, Blood Pressure
Intervention to Improve Medication Adherence

- Kripilani et al., 2007
- 209 Received personalized, illustrated pill card
- REALM
  - 41.6% Inadequate
  - 36.9% Marginal
- Those with inadequate or marginal literacy reported greatest use and helpfulness in medication adherence compared to those with adequate literacy (p<0.05)
1-Time In-person Education Interventions
6 Studies

Positive Outcomes
Higher rates of mammography
Medical information knowledge
Medication adherence
Asthma medication administration
Self-care behaviors

Negative Outcomes
Dietary behaviors

- Group Classes
  - Minimal written materials
  - Motivational
  - Use of role play, visuals, videos and entertainment
  - Personalized worksheets, notebooks

- One-on-One
  - Brief verbal instruction from educators
  - Supporting written materials
Intervention to Improve Diabetes and CVD Knowledge

- Hill-Briggs et al., 2008
- 30 Diabetics, high CVD risk
- WRAT-3
  - 40% <= 6th grade level
- 90-minute group class about diabetes and CVD, received easy-to-read written materials and personalized worksheets
  - Focus on disease information and self-management behaviors

Knowledge about diabetes and CVD increased for all subjects, regardless of literacy level (p<0.005)
Complex Interventions
10 Studies

• Disease and Case Management
  – Baseline assessment and education by medical providers or health educators
  – Ongoing follow-up via phone or appointment
  – Use of written, easy-to-read self-management materials
  – Support for addressing barriers to care
  – Social support, employment and literacy training

• Ongoing Classes and/or Follow-up
  – Education in group settings
  – Baseline assessments
  – Boosters and reinforcement via phone or mail
Complex Interventions: Outcomes

**Positive**
- HF exacerbations, associated costs, hospitalization and death
- Systolic blood pressure
- Self-care behaviors
- Depression
- HIV viral load
- Knowledge about medical information

**Mixed**
- Diabetes control (HbA1c)
- CD-4 counts
- Medication adherence
- Dietary self-efficacy, behaviors and outcomes

*Note: Disease and case management interventions generally had better outcomes than the serious of education classes.*
Intervention to Improve Diabetes Outcomes

- Rothman et al, 2004
- RCT
- Intervention group: 98 Control group: 95 (All adult diabetics)
- REALM: 38% Low, 61.8%
- Intervention group received disease management program: education from clinical pharmacist, clinical interventions, reminder/reinforcement calls, low literacy communication strategies

At 12 months, high and low literacy patients in the intervention group significantly improved their A1c and blood pressure compared to the control group (p<0.001, p=0.006 respectively).
Improving Patient-Provider Communication

2 Studies

- Physicians notified of patients’ literacy level and informed of possible barriers b/c of low literacy
- Physicians attended workshops and received feedback on performance

Positive Outcomes
- Rates of colorectal cancer screening
- Physician use of communication strategies

Negative Outcomes
- Self-efficacy
- Diabetes control (A1c)
Improving Literacy: Intervention for Depression

- Weiss et al., 2006
- RCT
- Intervention group: 33 Control group: 28
- All participants with REALM <60, PHQ-9 >5
- Intervention group received ongoing literacy training and depression treatment
- Control group received depression treatment only

Outcomes:
At 12 months, those in the intervention group had significantly improved depression symptoms (PHQ-9 scores) compared to the control group (p=0.04)
Discussion

• Variety of interventions tested for different disease states and purposes
  – Diabetes
  – CVD
  – Depression
  – Heart failure
  – HIV
  – Preventive care
  – Health knowledge
  – Adherence
  – Self-care behaviors

• Many mixed findings:
  – Knowledge
  – Adherence
  – Dietary behaviors
  – Health outcomes

• Improved health education materials do not always improve knowledge

• Classes and direct education can improve knowledge and some behaviors

• Complex, disease-management interventions show most improved outcomes in health status
Limitations and Gaps

• Variable quality of studies
  – Many uncontrolled, pre-post designs

• Only a subset of the studies stratified results by literacy level
  – Difficult to ascertain if intervention specifically helps low literacy population

• Studies without direct literacy measure excluded
  – Potentially more interventions that may improve outcomes

• Few studies on patient-provider communication and literacy improvement
Reviewed Studies

Health Education Materials

Written

Computer
Video

Self-Management

1-time In-Person Interventions

Groups

One-on-One
Complex Interventions


Patient-Provider Communication


Improving Literacy

Last updated 12.01.08

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