EVALUATING COMPREHENSION OF WRITTEN PHARMACY MATERIALS: PRELIMINARY EXPERIENCE WITH THE CLOZE PROCEDURE

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Background
- Functional health literacy...
- "Is the constellation of skills, including the ability to perform basic reading and numerical tasks required to function in the health care environment?"
- Measured using a variety of techniques with each addressing different aspects of the reading process that include reading comprehension, and action (See Figure 1).
- The Cloze procedure is used to measure comprehension.
- Grounded in Gestalt Psychological Theory.
- Cloze unit: a successful attempt to accurately reproduce a randomly deleted part of a "message" by deleting, from the context that remains, what the missing part should be.
- Considers total language context, Doug's learning theory of communication, and statistical random sampling.

Methods
Objective
- To assess reading comprehension of a common pharmacy-relevant educational brochure using the Cloze procedure in subjects expected to exhibit a wide range of health literacy proficiency.

Design
- A descriptive, cross-sectional, in-person interview was used.

Data Collection Instruments
- Background characteristics
  - Reading comprehension component of the Short Test of Functional Health Literacy (i.e., VS-TOFHLA).
  - Cloze procedure using a 400-word excerpt from a pharmacy-relevant educational brochure titled "How To Take Your Drugs Safely - Be an Informed Consumer." 
  - Bracketed items ( ) represent "cloze units" selected for deletion.
  - Comprehension measured by the percentage of Cloze units successfully completed using exact word matches.

"Unfortunately, drug errors happen. They happen in hospitals, [in] pharmacies, or even at [home]. And sometimes people get hurt because of these errors. [The] more information you [have], the [better] able you are [to] prevent errors and to [take] care of yourself. You [have] to ask your pharmacists, [doctors] and nurses about your [drugs], and you have to [expect] answers..."

Subject Selection
- Purposeful sample of 60 subjects from a university community and its affiliated local adult literacy center.
- Subjects who were less than 16 years of age, had 20/20 vision (legally blind) or worse, and who were non-native English speakers were excluded to ensure consistency with study populations used in other functional health literacy instrument development studies.

Implementation and Data Collection
- Project approved by the Drake Institutional Review Board.
- Research assistants administered the three-part interview to consenting participants.
- Subject names and/or identifying information were not recorded on any interview data collection forms to ensure anonymity of responses.

Results
Sample
- 60 subjects interviewed. 52 were included in the final sample.
- 8 subjects who did not meet eligibility criteria were excluded:
  - No affiliation with university community (n=1).
  - Improper vision correction (n=1).
  - Failure to attempt all assessments (n=2).
  - Non-native English speaker (n=4).

Results
- The internal consistencies of the VS-TOFHLA and the Cloze procedure were 0.95 and 0.91.
- Scores on the VS-TOFHLA and Cloze procedure were highly correlated (r=0.72, p < 0.0001).

Table 1 - Demographic Characteristics

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>9</td>
<td>17.3</td>
</tr>
<tr>
<td>Female</td>
<td>43</td>
<td>86.7</td>
</tr>
<tr>
<td>Education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than HS</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Some HS</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>HS Gradate</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>Some College</td>
<td>8</td>
<td>16</td>
</tr>
<tr>
<td>College Graduate</td>
<td>33</td>
<td>66</td>
</tr>
<tr>
<td>Race</td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>48</td>
<td>96</td>
</tr>
<tr>
<td>Non-White</td>
<td>6</td>
<td>12</td>
</tr>
<tr>
<td>Mean (SD) Age in Years</td>
<td>46.3 (12.9)</td>
<td></td>
</tr>
</tbody>
</table>

Table 2 - Pharmacy-Relevant Comprehension Assessment Tool Scoring

<table>
<thead>
<tr>
<th>Percentage of Correct Cloze Units</th>
<th>Level</th>
<th>Number (% of Participants)</th>
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</thead>
<tbody>
<tr>
<td>≥ 60</td>
<td>Passage is Understood</td>
<td>35 (59)</td>
</tr>
<tr>
<td>&gt; 40</td>
<td>Requires Supplementary Teaching</td>
<td>11 (21)</td>
</tr>
<tr>
<td>≥ 0 to &lt; 40</td>
<td>Passage is Not Understood</td>
<td>6 (12)</td>
</tr>
<tr>
<td>Total</td>
<td>52 (100)</td>
<td></td>
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Discussion and Conclusions
- First research to report use of the Cloze procedure to assess comprehension of written pharmacy-relevant materials.
- The Cloze procedure effectively discriminated across levels of comprehension in this highly educated sample.
- The pharmacy-relevant comprehension assessment demonstrated concurrent validity with the VS-TOFHLA and was found to reliably perform on the VS-TOFHLA to perform on a pharmacy-relevant comprehension test.
- This pilot study suggests promise for using the Cloze procedure to assess patient comprehension of pharmacy-relevant educational materials, although future work should expand the sampling.
- Further assessment of the diagnostic capacity for the pharmacy-relevant comprehension assessment in identifying individuals at risk for not understanding written educational material is required.

References