Health Literacy/Numeracy: Important Success Factors in Patients With Type 2 Diabetes
Poor health literacy is a stronger predictor of a person’s health than income, employment status, education level, and racial or ethnic group.
Health Literacy in the United States, 2003

- 36% of Adult Americans have “Basic” or “Below Basic” health literacy.
- 12% of Adult Americans have “Proficient” health literacy.

Health Literacy in Patients With Type 2 Diabetes

- Inadequate health literacy/numeracy is a major challenge in patients with type 2 diabetes.
- Diabetes self-management requires both knowledge of what to do and the ability to follow pharmacologic and lifestyle regimens.
- To successfully self-manage type 2 diabetes, patients must know how to monitor the disease, manage symptoms, carry out daily medical regimens, and interpret results of home-monitoring.

Limited health literacy is common among vulnerable populations including racial and ethnic minorities, the poor, elderly persons, and patients with chronic conditions, including type 2 diabetes.

Conceptual Framework of Factors Affecting Health Literacy in Type 2 Diabetes

- Socioeconomic Status (eg, education, income)
- Vulnerable Populations
- Demographic Factors (eg, age, ethnicity, race)

Health Literacy

- Diabetes Knowledge
- Self-Care Activities (eg, glucose monitoring, medication, foot care)
- Diabetes Clinical Outcomes (eg, A1C, morbidity)
Numeracy and Literacy Independently Predict the Ability of Patients With Diabetes to Identify Out-of-Range Test Results

Predicted probabilities that patients with diabetes would correctly identify A1C test results as outside the standard range

- 38% for Low Literacy (Score = 3) and Low Numeracy (Score = 3)
- 60% for High Literacy (Score = 5) and Low Numeracy (Score = 3)
- 58% for Low Literacy (Score = 3) and High Numeracy (Score = 6)
- 77% for High Literacy (Score = 5) and High Numeracy (Score = 6)

* Internet-administered survey of 1817 adults aged 40–70 years (approximately 50% with diabetes)
* Participants were asked to imagine that they had type 2 diabetes
* A1C results were randomized to be slightly (7.1%) or moderately (8.4%) outside the reference range
* Other test results were randomized to be within or outside their reference ranges
* Numeracy was measured using the Subjective Numeracy Scale (SNS)
* Health literacy was based on the mean response to 3 questions and ranged from 1 (least literate) to 5 (most literate)

Regarding contacting their doctor, less numerate and literate participants with diabetes appear insensitive to the A1C level shown, whereas highly numerate and literate participants with diabetes appear very sensitive.
The Newest Vital Sign: A Brief Screen for Literacy/Numeracy in Patients With Type 2 Diabetes

- The Newest Vital Sign uses an ice cream nutrition label and 6 questions to test for literacy/numeracy.
- The Newest Vital Sign quickly provides valuable insight regarding the ability of a patient with diabetes to complete a practical skill needed to achieve glucose control.

Newest Vital Sign Food Label, Questions, and Answers

<table>
<thead>
<tr>
<th>Nutrition Facts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serving Size</td>
</tr>
<tr>
<td>Servings per container</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Amount per serving</th>
<th>Calories</th>
<th>Fat Cal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serving Size</td>
<td>250</td>
<td>120</td>
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<table>
<thead>
<tr>
<th>%DV</th>
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<tbody>
<tr>
<td>20%</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Total Fat</th>
<th>13g</th>
<th>20%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sat Fat</td>
<td>9g</td>
<td>40%</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Cholesterol</th>
<th>28mg</th>
<th>12%</th>
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</thead>
<tbody>
<tr>
<td>Sodium</td>
<td>55mg</td>
<td>2%</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Total Carbohydrate</th>
<th>30g</th>
<th>12%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dietary Fiber</td>
<td>2g</td>
<td></td>
</tr>
<tr>
<td>Sugars</td>
<td>23g</td>
<td></td>
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</tbody>
</table>

| Protein | 4g | 8% |

*Percentage Daily Values (DV) are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs.

**Ingredients:** Cream, Skim Milk, Liquid Sugar, Water, Egg Yolks, Brown Sugar, Milkfat, Peanut Oil, Sugar, Butter, Salt, Carrageenan, Vanilla Extract.

Score Sheet for the Newest Vital Sign Questions & Answers

**READ TO SUBJECT:** This information is on the back of a container of a pint of ice cream.

1. If you eat the entire container, how many calories will you eat?
   - Answer: 1,000 is the only correct answer

2. If you are allowed to eat 60 grams of carbohydrates as a snack, how much ice cream could you have?
   - Answer: Any of the following is correct: 1 cup (or any amount up to 1 cup), half the container. Note: if patient answers “two servings,” ask “How much ice cream would that be if you measure it into a bowl?”

3. Your doctor advises you to reduce the amount of saturated fat in your diet. You usually have 42g of saturated fat each day, which includes one serving of ice cream. If you stop eating ice cream, how many grams of saturated fat would you be consuming each day?
   - Answer: 33 is the only correct answer

4. If you usually eat 2,500 calories in a day, what percentage of your daily value of calories will you be eating if you eat one serving?
   - Answer: 10% is the only correct answer

**READ TO SUBJECT:** Pretend that you are allergic to the following substances: Penicillin, peanuts, latex gloves, and bee stings.

5. Is it safe for you to eat this ice cream?
   - Answer: No

6. (Ask only if the patient responds “no” to question 5.) Why not?
   - Answer: Because it has peanut oil.

**Interpretation**

**Number of Correct Answers**

Score of 0-1 suggests high likelihood (50% or more) of limited literacy.
Score of 2-3 indicates the possibility of limited literacy.
Score of 4-6 almost always indicates adequate literacy.
Strategies to Improve Health Literacy and Numeracy in Patients With Type 2 Diabetes

- **Use plain language**
  - Replace medical jargon and technical terms with words people use every day in conversation with each other
  - Present print information in a user-friendly way by organizing material into units in the order needed to understand subsequent information

- **Avoid phrases/words that can have 2 interpretations**
  - Words like “could” or “might” may be difficult to understand. Explain to patients what these phrases/words mean

- **Write out acronyms and other new terms**

- **Avoid using common words in unusual ways**
  - Negative test results may sound bad, while positive test results may sound good to a patient. Explain exactly what is meant by negative/positive test results

- **Be culturally sensitive**
  - Recognize the difference in meaning that words may have between different racial and ethnic groups and between generations

- **Ask open-ended questions**
  - “Some people have problems remembering to take their medicine. If this happens, what will you do?”

- **Use the Teach-Back Method—ask patients to explain or demonstrate what they just learned**
  - “Please tell me in your own words what we have discussed today”

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Pictograms, or standardized graphic images, are useful for conveying important information to patients with low health literacy.5
For Additional Information:


References


