Implementation and Evaluation of a Low Health Literacy and Culturally Sensitive Diabetes Education Program (Poster)

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Implementation and Evaluation of a Low Health Literacy and Culturally Sensitive Diabetes Education Program

Deborah Swavely DNP, RN; Allison Vorderstrasse, DNSc, APRN; Edgardo Maldonado, MD; Sherrine Eid, MPH; Jeffrey Etchason, MD
Lehigh Valley Health Network, Allentown, Pennsylvania

Background
- Health literacy – degree to which individuals have the capacity to obtain, process, and understand basic health information and services to make appropriate health decisions
- 36% of adults (78 million people) have low or basic healthy literacy skills
- Diabetes self-management is complex, requiring knowledge and skills pertaining to diet, exercise, blood glucose monitoring, and medication administration
- Individuals with diabetes and low health literacy (LHL) have poorer glycemic control, higher rates of rehospitalization, and more episodes of hypoglycemia

Objective
Evaluate the effectiveness of a LHL diabetes education program by measuring patients’ diabetes knowledge, self-efficacy, self-care, and metabolic control; and, patient, provider, and staff satisfaction.

Methods

Study Design
A prospective pre-post evaluation design was utilized to investigate the short term outcomes over 12 months for patients who completed the culturally sensitive LHL diabetes education program.

Participants
English and Spanish speaking patients with type 2 diabetes aged 18 years and older referred from six primary care medical practices located in urban setting.

Program Description
- Individual and group diabetes education sessions provided in English and Spanish, encompassing 13 hours of education over 12 weeks
- The U.S. Diabetes Conversation Maps were used for their visual approach to diabetes education experience
- Education facilitated by lay health workers and professional staff who had prior diabetes education experience
- Staff received training on health literacy, effective and clear communication techniques, cultural tailoring, and incorporating self-efficacy into patient encounters

Measures
- Self-reported demographic and health information
- Health literacy using the Short Test of Functional Health Literacy in Adults (STOFHLA) tool and the diabetes knowledge using the Spoken Knowledge in Low Literacy for patients with Diabetes (SKILLD) tool
- A1C values from the hospital’s data warehouse
- Self-efficacy using the Stanford Diabetes Self-Efficacy tool
- Diabetes self-care using the Summary of Diabetes Self-Care Activities tool

Analyses
- Descriptive statistics were calculated as mean with standard deviation (SD) or frequency and percentage for categorical variables
- Change in diabetes knowledge was analyzed using the McNemar test for paired proportions. Pairs were determined by percent of patients who achieved and did not achieve a pre-determined knowledge score of 80% before and after the education intervention
- A1C, diabetes self-care behaviors, and self-efficacy were evaluated by comparing pre- and post-test mean scores using a paired t-test
- Data were also stratified for diabetes knowledge by adequate and inadequate health literacy levels as a secondary analysis comparing pre- and post-test mean knowledge scores using a paired t-test

Findings

Demographics
- Over the 12 month evaluation period a total of 277 patients enrolled in the program, with 106 patients having complete survey data
- 77.4% of the patients were Hispanic, mostly Puerto Rican, living in the United States for longer than ten years, and preferred to speak Spanish
- The mean age was 56.8 (± 10.4 years) with 66% of participants female
- 63.2% of patients had adequate health literacy, with 11.3% of patients scoring in the marginal, and 25.5% of patients in the inadequate health literacy categories

Health Literacy
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Results from the program evaluation were similar to other LHL diabetes education studies. Significant improvements occurred in diabetes knowledge, self-efficacy, the diet, exercise, and foot care domains of self-care, and A1C for patients who completed the program. Importantly, improvements in diabetes knowledge were significant for patients with both adequate and inadequate health literacy.

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Conclusion
Results from the program evaluation were similar to other LHL diabetes education studies. Significant improvements occurred in diabetes knowledge, self-efficacy, the diet, exercise, and foot care domains of self-care, and A1C for patients who completed the program. Importantly, improvements in diabetes knowledge were significant for patients with both adequate and inadequate health literacy.

Gaver the relationship between LHL and poorer health outcomes and increased costs, health care organizations and providers need to take action to transform systems of care to address the literacy needs of patients.

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Table 1. Stratification by Literacy Level

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Adequate Health Literacy (n=66)</th>
<th>Inadequate Health Literacy (n=39)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HgbA1C</td>
<td>Pre (M $\pm$ SD) 8.47 (7.43 $\pm$ 3.39)</td>
<td>Post (M $\pm$ SD) 6.59 ($\pm$ 0.921)</td>
</tr>
</tbody>
</table>

Table 2. Self-care, Self-efficacy, and A1C

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Pre (M $\pm$ SD)</th>
<th>Post (M $\pm$ SD)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diabetes Self Care</td>
<td>3.58 ($\pm$ 1.23)</td>
<td>4.89 ($\pm$ 1.23)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Diet (n=106)</td>
<td>3.94 ($\pm$ 1.23)</td>
<td>4.89 ($\pm$ 1.23)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Exercise (n=106)</td>
<td>3.94 ($\pm$ 1.23)</td>
<td>4.89 ($\pm$ 1.23)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Blood Sugar Testing (n=106)</td>
<td>3.94 ($\pm$ 1.23)</td>
<td>4.89 ($\pm$ 1.23)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Foot Care (n=105)</td>
<td>3.94 ($\pm$ 1.23)</td>
<td>4.89 ($\pm$ 1.23)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Self Efficacy (n=105)</td>
<td>3.94 ($\pm$ 1.23)</td>
<td>4.89 ($\pm$ 1.23)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Weight (n=106)</td>
<td>3.94 ($\pm$ 1.23)</td>
<td>4.89 ($\pm$ 1.23)</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

Patient knowledge significantly improved with 91% of the patients scoring 85% correct or higher on the SKILLD open comprehension questions after the program. In the post-test, 87.25% of patients scored 80% or higher on the program. Importance, improvements in diabetes knowledge were significant for both self-care behaviors and A1C.

To account for levels of health literacy, the cadastity SKILLD score was analyzed by adequate and inadequate health literacy. Patients were grouped into two categories based on their health literacy levels. Individuals who had adequate health literacy were defined as having a knowledge gap score of 11 or less, the knowledge gap score was defined as the difference between the two groups.

Statistically significant change in patient reported self-care behaviors (e.g., record weights) and that they followed recommended diet, exercise, and foot care regimens, with no statistical change in the frequency of glucose testing. Self-efficacy scores as measured on a scale of 1-10 were generally increased at the completion of the program. The program was implemented in pre-program and posted post-education and maintained the difference.