The Role of Health Literacy on the Impact of a Diabetes Education Intervention

Vanessa Ann Figueroa, MSN, APRN, AGPCNP-BC ; K. Melissa Smith Hayes, DNP, ANP-BC, CHFN
Vanderbilt University School of Nursing

SCHOOL OF NURSING
VANDERBILT UNIVERSITY

INTRODUCTION

The risk of complications from diabetes is higher in those with low health literacy (LHL). It is important to identify any impact health literacy may play in a type-2 diabetic's ability to improve their diabetes knowledge. If the diabetic education intervention is mismatched to the learner's health literacy level, the intervention must be altered in order to be more effective for diabetics with a lower health literacy level (Kim & Lee, 2016).

Problem

- Health plan members for a large American health insurance company are visited yearly by a nurse practitioner during an annual wellness visit.
- During these visits: (1) poorly-controlled diabetes can be identified via hemoglobin A1C, and (2) diabetic members often require education about their disease.
- According to Kim & Lee (2016), low health literacy (LHL) impedes successful diabetes self-management. Diabetes knowledge regarding diet and self-management actions may be limited in diabetic patients whose disease is poorly controlled.
- Many diabetic members may not have the health literacy skills necessary to manage their chronic illness effectively, leading to poorer health outcomes. LHL has been shown to negatively impact medication adherence (Cavanaugh, 2011).

PICOT Question

Do type-2 diabetic health plan members without low health literacy (REALM-SF Score = 7) have more improvement in DKT scores after a spoken communication education intervention compared to type-2 diabetic members with low health literacy (REALM-SF = < 7)?

Purpose

The purpose of this project is the implementation of a diabetes education intervention by a nurse practitioner to participants with type-2 diabetes.

Aims

- Improved diabetes knowledge scores
- Analysis of diabetes knowledge scores between type-2 diabetic members with and without low health literacy (LHL)

METHODS

Project Design

- Translating evidence into practice
- Evidence suggests a correlation between health literacy and diabetes knowledge (Kim & Lee, 2016; Caruso et al., 2018; Marciano et al., 2019)

Setting

- The annual wellness visit occurred one-on-one between the participant and the nurse practitioner investigator in the participant's home

Participants

- Must have diagnosed type-2 diabetes mellitus defined as meeting criteria for diagnosis by an elevated hemoglobin A1C level on two separate occasions (Mayo Clinic, 2022)

Tools

Rapid Estimate of Adult Literacy in Medicine – Short Form (REALM-SF)

- Provides a valid quick assessment of patient health literacy (AHRQ, 2016)

Diabetes Knowledge Test (DKT)

- Serves to assess a general knowledge of diabetes and diabetes self-care
- Modified 20-question T/F version used
- Eight of the most relevant items from the modified T/F version as pre and post test

Intervention

- The intervention was a spoken communication strategy with material from a diabetes education booklet read aloud to project participants.
- The diabetes education booklet is titled, "*Taking Charge of Your Diabetes*," and was developed by the administering NP's organization.
- The booklet offers information regarding various topics related to diabetes and its management.

Step-by-Step Implementation Plan

- Administer the REALM-SF to assess health literacy
- Collect the participants last known hemoglobin A1C value
- Administer eight items from the T/F DKT pretest
- Complete the diabetes education intervention by providing the education from the booklet aloud to the participant
- Administration of DKT T/F posttest
- Disseminate the diabetes education booklet to the participant

Age	n (%)
<50 years	0 (0)
50 – 70 years	3 (30)
>70 years	7 (70)
Gender	
Male	5 (50)
Female	5 (50)
Education	
< 12th grade	3 (30)
>= 12th grade	7 (70)
Race	
White	8 (80)
Black	2 (20)

Table 1. ***Sample Characteristics (N = 10)***

Health Literacy Score (<7 = LHL)		Pretest (Max Score = 8)	Posttest (Max Score = 8)		Hgb A1C
6		7	8		7.8
7		8	8		7
7		8	8		6.9
6		5	6		5.8
7		8	8		6.3
7		8	8		5.6
7		6	7		12.1
7		8	8		6.6
6		6	7		8
7		8	8		8.3
Average Score		7.2	7.6		
Standard Deviation		1.1352924 2	0.6992059		

Table 2. ***Health literacy, pretest/posttest, and hemoglobin A1C scores per participant***

RESULTS

Analysis of collected data revealed:

- Diabetes knowledge scores were improved by the educational intervention
- All three subjects with low health literacy (REALM-SF < 7) were able to improve their diabetes knowledge score following the diabetes education intervention
- Normal health literacy participants (n = 7) either improved by one point or retained their score of 8/8
- All subjects with low health literacy (n = 3) had <12 grade education level
- Good health literacy (REALM-SF = 7) did not necessarily mean good glycemic control or better health outcomes

IMPLICATIONS FOR PRACTICE

- The "*Taking Charge of Your Diabetes*" tool should continue to be utilized for diabetics who have low health literacy during the annual wellness visits.
- Other HouseCalls practitioners should be informed of the results of this project and encouraged to read aloud from the intervention booklet to their diabetic patients requiring education.

CONCLUSIONS

- The current evidence reviewed demonstrates a clear correlation between health literacy and patient knowledge of type-2 diabetes (Caruso et al., 2018; Marciano et al., 2019). This was true for the small population in this project.
- The spoken diabetes education intervention tested during this small project was appropriate for teaching subjects with low health literacy (REALM-SF < 7).
- Diabetic subjects with low health literacy were able to learn and improve their diabetes knowledge score.
- This project determined there was no relationship between health literacy and glycemic control based on hemoglobin A1C in this small group.
- Future research should continue testing the appropriateness and the effectiveness of education interventions designed to teach diabetic patients with low health literacy.

REFERENCES

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