

Creating an Educational Model for Diabetes Health Literacy in Rural Alabama

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Health Literacy is the ability to read, understand, and act appropriately on health information (Behringer *et al.*). It is estimated that over 50% of the adult United States population has deficiencies in reading skills. Roughly forty million Americans read at or below a fifth grade level, rendering them “functionally illiterate.” Such individuals are especially at risk when faced with advanced medical terminology. In addition to those forty million Americans, an additional fifty million Americans are considered marginally literate (American Medical Association). Although a national survey assessing Americans’ health literacy levels has not been completed, there is a correlation between general literacy levels and health literacy levels in that health literacy levels are usually lower. For instance, if a physician handed a prescription to a patient that stated he or she needed to take medication twice a day, the individual would exhibit good health literacy if he or she later successfully followed these instructions. However, if the patient cannot read or remember the physician’s instructions during the medical visit, he or she would be at a distinct disadvantage in following through with the treatment regimen.

In relation to health literacy, diabetes is a top concern to the state of Alabama due to its prevalence. Diabetes, the fifth leading cause of death from disease, upsets the body’s ability to use sugar and is closely associated with obesity (The Ohio State University Medical Center). It affects a total of 18.2 million people with health care costs totaling around 132 billion dollars (American Diabetes Association; Hogan, Paul, *et al.*). In 2002, diabetes was listed as the sixth leading cause of death in Alabama (Center for Disease Control and Prevention). Additionally, in 2001, Alabama led the nation in diagnosed cases of diabetes and obesity per capita. According to the Center for Disease Control and Prevention, the number of cases of diabetes in Alabama has increased from 4-6% in 1990 and 1995 to over 10% in 2001 (Mokdad *et al.*). Living with type 2 diabetes requires daily

attention to what and how much an individual eats, getting regular exercise, monitoring blood sugar levels and possibly taking medication. Nonetheless, before patients can effectively manage their diabetes, they first must understand the basic vocabulary describing their disease and its management.

One in every three Americans struggles with low health literacy (Partnership for Clear Health Communication). These patients encounter words such as ketoacidosis, nephropathy, or other medical terminology that exceed a high school reading level during their clinical visits. This disadvantage created by a low health literacy concerning diabetes is a concern for rural Alabama. To combat this issue, a partnership between we Computer-Based Honors students and University of Alabama faculty has developed a Diabetes Health Literacy Assessment for the Pocket PC. This assessment addresses two major issues facing the United States and specifically the state of Alabama: a dramatic upswing in the prevalence of diabetes, as well as illiteracy.

The Diabetes Health Literacy Assessment is an adaptation of paper standardized tools programmed on the .Net platform using the C# language and Windows Mobile 2003 for the Pocket PC. The program evaluates diabetes-specific health literacy in relation to standards of diabetes care, comorbid health problems, medication complexity, and diabetes-specific quality of life among rural dwellers. The purpose of the assessment is to determine if rural residents understand the terminology used by their health care providers in reference to their diabetic needs. The program consists of four main forms: Demographic Data, the Literacy Assessment for Diabetes, Diabetes Quality of Life, and Word Comprehension. The Demographic Data form acts like a brief medical history and collects common information such as age, gender, and race. The Literacy Assessment for Diabetes evaluates the grade reading level of the patient based on correct pronunciations. There are

sixty words of varying difficulty ranging from sugar to endocrinologist. The Diabetes Quality of Life evaluates the patient's opinion of how his or her quality of life has been affected by diabetes. The Word Comprehension Assessment provides a more in-depth comprehension of terms by asking patients to provide his or her own definition of six commonly encountered words for individuals with diabetes.

The Diabetes Health Literacy Assessment has been used to collect data from the Good Samaritan Clinic in Tuscaloosa and plans have been made to visit other rural clinics in West Alabama, including those in Parrish and Gordo. Data collection and analysis will continue throughout the summer of 2005. From currently collected data, a prevalence of low health literacy concerning diabetes has been noticed. One of the contributing factors of low health literacy is a patient's hesitation to approach health care professionals with questions because they feel embarrassed. Yet, when we interviewed patients, it was noted that the patients were eager to ask questions about terms and attentively listen to our elementary explanations.

Impressed by their eagerness to learn about their own health conditions and compelled by the prevalence of low health literacy in Tuscaloosa alone, we have expanded their research to include an educational model of the working vocabulary concerning diabetes and diabetes management in rural areas. With input from physicians and other health care providers, information concerning diabetes and its management will be presented to patients using multimedia in the DVD format. Two rural clinics will be outfitted with portable DVD players so that a patient can watch the DVD without garnering much attention. By using the multimedia approach, the handicap caused by low literacy will be reduced. The effectiveness of this approach will be determined by giving patients a pre-and post-evaluation. Pending positive results, the possibility of expanding the educational tools to other areas in Alabama as well as adapting the model for use in other areas of health literacy will be explored. The Diabetes Health Literacy Assessment and educational DVD will also be translated into Spanish to meet the need of the growing Hispanic population.

References

- "All About Diabetes." *Diabetes Information*. American Diabetes Association. 18 Apr. 2005 <<http://www.diabetes.org/about-diabetes.jsp>>.
- Behringer, Melissa B., et al., *Medical Home Health Literacy: Bringing Health to Life*. Alabama Medicaid Agency. 2004.
- "Deaths and percentage of total deaths for the 10 leading causes of death, by race: United States, 2002." *National Vital Statistics Report*. 7 Mar 2005. Center for Disease Control and Prevention. 18 Apr. 2005 <http://www.cdc.gov/nchs/data/dvs/nvsr53_17tableE2002.pdf>.
- "Health Literacy: Report of the Council on Scientific Affairs." Ad Hoc Committee on Health Literacy for the Council on Scientific Affairs, American Medical Association. *JAMA*. 1999. 281: 552-557.
- Hogan, Paul, et al. "Economic Costs of Diabetes in the U.S. in 2002." *Economic Costs of Diabetes in the U.S. in 2002*. 2003. Diabetes Care. 18 Apr. 2005 <<http://care.diabetesjournals.org/cgi/content/full/26/3/917>>.
- "Literacy Skills are Strongest Predictor of Health Status in the United States." 7 May 2003. Partnership for Clear Health Communication. 18 Apr. 2005 <http://www.pfizerpublichealth.com/PDFs/clearhealth_release.pdf>.
- Mokdad AH, Ford ES, Bowman BA, et al. Prevalence of obesity, diabetes, and other obesity-related health risk factors, 2001. *JAMA* 2003 Jan 1;289(1):76-9.
- "Statistics About Diabetes." *Statistics About Diabetes*. 2005. The Ohio State University Medical Center. 18 Apr. 2005 <<http://medicalcenter.osu.edu/patientcare/healthinformation/diseasesandconditions/diabetes/statistics/>>.

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