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Comparing perceived self-management practices of adult type 2 diabetic patients after completion of a structured ADA certified diabetes self-management education program with unstructured individualized nurse practitioner led diabetes self-management education

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ABSTRACT

Purpose: The purpose was to compare perceived self-management practices of adult type 2 diabetic patients after completing an American Diabetes Association (ADA) certified diabetes self-management education (DSME) program with unstructured individualized nurse practitioner led DSME.
Methods: Demographic questions and the Self-Care Inventory-Revised (SCIR) were given to two convenience sample patient groups comprising a formal DSME program group and a group within a clinical setting who received informal and unstructured individual education during patient encounters. A *t*-test was executed between the formal ADA certified education sample and the informal sample's SCI-R individual scores. A second *t*-test was performed between the two samples' SCI-R mean scores.
Results: A *t*-test determined no statistically significant difference between the formal ADA structured education and informal education samples' SCI-R individual scores. There was not a statistically significant difference between the samples' SCI-R mean scores.
Discussion: The study results suggest that there are not superior DSME settings and instructional approaches.

1. Introduction and background

The medical consequences and financial costs of diabetes are staggering. Poorly controlled diabetes is responsible for a 12-fold increase in stroke and heart disease risk and a 16-fold risk of peripheral neuropathy (Nazarko, 2009). People with diabetes are at increased risk for cardiac complications and retinopathy, which may result in blindness. In addition, diabetes reduces overall life expectancy by 10–15 years (Nazarko, 2009). In 2012, diabetes affected 9.3% (29.1million) of the US population, and among people with diabetes 65 years and older, in 2004, heart disease was seen on 68% and stroke appeared on 16% of death certificates (Centers for Disease Control and Prevention [CDC], 2014). From 2005–2008, 28.5% individuals with diabetes 40 years and older suffered from diabetic retinopathy. Significantly increasing risk for blindness, 4.4% of the diabetic retinopathy patients had severe diabetic retinopathy. Approximately 65,700 patients with diabetes suffered nontraumatic lower-limb amputations in 2006, and diabetes was the direct cause of kidney failure, comprising 44% of all new cases in 2008 (CDC, 2014). The financial burden of diabetes is sobering. In 2012, the total cost of diabetes in the United States was $245 billion. Direct medical costs were $176 billion while $69 billion were indirect costs such as disability, work loss, and early death (American Diabetes Association, [ADA], 2013).

Searches in the Cumulative Index to Nursing and Allied Health Literature were completed using the following criteria: journal articles published in English between 2003 and 2014, possessing the word diabetes in the title, and the key words self-management, education, and self-care were utilized. The search concentrated on professional journal articles from nursing and from other disciplines. Only those articles that were peer reviewed with references and abstracts available were included. Additional inclusion criteria required statements about the topic and clearly articulated research questions. Moreover, precisely stated research designs with unambiguous, concisely stated results were requisite inclusion criteria. The search revealed a plethora of literature supporting formal diabetes self-management education (DSME) programs as ways to reduce the medical consequences and costs of diabetes (Atak, Gurkan, & Kose, 2008; Clarke, 2009; Fitzner et al., 2008; Gill, Kumar, & Wiskin, 2008; Hicks, 2010; Moriyama et al., 2009; New, 2009; Siminerio, Ruppert, Emerson, Solano, & Piatt, 2008; Sousa, Zauszniewski, Musil, Price Lea, & Davis, 2005; Tol et al., 2012; Wu et al., 2011). Representing a gap in the literature, studies within clinical settings representing informal individual patient practitioner led DSME were not found. The research questions for this study were as follows:

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1) What were the perceived self-management practices of adult type 2 diabetic patients after completing a formal DSME program? 2) What were the perceived self-management practices of adult type 2 diabetic patients who received informal DSME during clinical patient encounters? 3) Do adult type 2 diabetic patients who attend formal DSME perceive themselves to have greater diabetes self-management than those adult type 2 diabetics who only receive DSME during clinic visits?

2. Diabetes self-management education and reduction of healthcare costs

Society has shouldered the skyrocketing costs of diabetes for many years. DSME has demonstrated great promise to reduce diabetes financial public encumbrance. Hospital readmission rates for patients with diabetes who received no DSME at follow-up were 38.1 per person per 100 years (Robbins, Thatcher, Webb, & Valdmanis, 2008). The hospitalization readmission rate was 34% lower (25.0 per person per 100 years) among patients with diabetes who at follow-up received just one DSME session (Robbins et al., 2008). Healy, Black, Harris, Lorenz, and Dungan (2013) discovered among poorly controlled inpatients with diabetes, inpatient-DSME was correlated with 34% reduced odds of all-cause readmission by 30 days and 20% reduced odds of readmission by 180 days. Increasing medical costs exponentially, the cyclic nature of diabetes related illness, hospital admission, absent or ineffective diabetes education, early discharge, results in rapid hospital readmission. Boren, Fitzner, Panhalkar, and Specker (2009) engaged in a literature review and discovered that 18 of 26 papers reported associations between DSME and decreased cost. The total mean diabetes related cost per patient per year was $918 lower after the first year of enrollment in DSME (Boren et al., 2009).

3. Purpose

The purpose of this study was to measure and compare two adult convenience patient samples with type 2 diabetes mellitus (T2DM) perceived self-management practices. One sample (n = 52) graduated from a formal DSME program, and the second sample (n = 52) never attended formal DSME classes. Within the clinical setting, during patient encounters, the second sample received informal clinician led DSME.

4. Methodology

4.1. Study design

A descriptive prospective comparative design was selected. The study design consisted of a convenience sample of 52 graduates of the DSME program. Participants identified their race, age, gender, marital status, highest level of education, family income, date of graduation from the program, and ability to read and write English. In addition, participants were asked if they have a diagnosis of diabetic neuropathy and renal disease. Participants completed La Greca's Self Care Inventory-Revised Version (SCI-R) survey (Weinger, Butler, Welch, & La Greca, 2005). Dr. La Greca granted permission for the use of the SCI-R in this study. The survey measured the samples' perceived diabetes self-management practices. The same demographic questions and survey instrument were given to a second convenience sample of 52 diabetic patients who received informal DSME during clinical encounters.

4.2. Human subject protection

Prior to study implementation, the institutional review board (IRB) application was submitted to the University of Southern Indiana's (USI) IRB on August 2013. Upon attaining USI's IRB approval, the DSME program gave permission to proceed with the study. The USI's IRB granted Expedited approval September 19, 2013. The authors resubmitted data collection protocol revisions to USI's IRB September 2013 and were granted Expedited approval October 10, 2013.

4.3. Setting

In south-central Kentucky, the ADA certified DSME program offers free comprehensive education through 10 county health departments. Occurring in all 10 counties, education was a series of four weekly sessions. Each session lasted two and one-half hours. The series was titled *Living Well with Diabetes.* Session 1 dealt with describing diabetes, coping with diabetes, physical activity, nutrition-healthy eating and goal setting. Session 2 involved monitoring, acute complications, nutrition-plate method, portion sizes, sugar substitutes, and physical activity. Topics for session three comprised pattern management, medications/insulin, exercise and diabetes, nutrition-carbohydrate counting, and food labels/meal planning. Session 4 foci entailed chronic complications, daily care: skin/foot care, sick days, tobacco use, nutrition-healthy heart, weight loss, fast food, and physical activity (Lake Cumberland District Health Department Home Page, n.d.). Graduation from the program required attending all four sessions. The informal non-structured nurse practitioner led DSME occurred during patient encounters in a hospital owned rural health family practice setting in south central Kentucky.

4.4. Study implementation

Data collection began after IRB approval was obtained. Beginning in October 2013 and concluding in December 2013, program graduates were invited to complete the instrument measuring perceptions of diabetes self-management skills. A second sample of 52 adult patients with diabetes who only received education during clinic visits and who never attended formal DSME classes completed the same demographic questions and survey instrument. Beginning in April 2014 and concluding in May 2014, the first author recruited participants from the clinical setting. Facility permission to recruit patients for study participation was granted. Inclusion criteria for the education sample encompassed a diagnosis of T2DM and graduation of the DSME program. In addition, each participant was required to be 21 years of age or older. Inclusion criteria for the informal education sample were the same as for the education sample with the exception that participants were required to have never attended formal DSME and have only received unstructured DSME during clinical encounters.

A packet containing a cover letter, informed consent, demographics survey, and survey instrument was mailed to formal DSME program graduates. The demographics survey included participants' age, race, gender, marital status, highest level of education, family yearly income, date of program graduation, and ability to read and write English. Furthermore, participants were asked if they have been diagnosed with diabetic neuropathy or renal disease. The author recruited informal DSME education participants during patient encounters. In place of a cover letter, the first author verbally explained the purpose of the study. Patients who agreed to participate signed the same consent form that was given to the formal DSME sample, and the first author guided the participants through the same demographic questions and survey instrument that was given to formal DSME graduates.

4.5. Instrument

The SCI-R is a self-report survey that measures perceived diabetes self-management practices. The instrument produces ordinal level data. The SCI-R's Flesch–Kincaid Reading level is 6th grade (Weinger et al., 2005). Participants rated 15 items on a five-point Likert scale that reflected how well they perceived themselves to abide by recommendations for self-care during the past one to two months (Weinger et al., 2005). For each survey question, participants could choose: 1 (never); 2 (rarely); 3 (sometimes); 4 (usually); 5 (always). Each of