



Research Article

Improving Self-Management of Type 2 Diabetes in African Americans Age 40 and Over: Development and Implementation of a Culturally Sensitive Community Education Program

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Summary

African Americans in the United States diagnosed with diabetes are more likely than other populations to suffer from diabetes-related complications such as end-stage renal disease, hypertension, stroke and lower extremity amputations secondary to poor diabetes self-management. Increasing the healthcare providers' and patients' knowledge and understanding of proper diabetic self-management for African Americans, in an effort to reduce diabetes related complications requires examination of evidence-based research, which may lead to opportunities to improve the impact of diabetes educational programs within their communities. The project results indicated that patient education programs focused on diabetic self-management presented in a culturally sensitive approach have a significant outcome on blood pressure, weight and finger stick blood glucose levels.

Keywords: African-American; Culturally-sensitive education; Diabetes self-management

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Introduction

Diabetes is one of the leading causes of death and disability in the United States with the total prevalence being approximately 8.3% of the population. According to the Center for Disease Control 2011 fact sheet, there are approximately 25.6 million or 11.3% of people age 20 and older in the United States diagnosed with diabetes while 10.9 million or 26.9% of all people in the age group of 65 and older have been diagnosed with diabetes. In addition, an increased disease burden is observed among racially and ethnically diverse groups, particularly African Americans who account for 4.9 million or 18.7 percent of all non-Hispanic blacks with diabetes [1,2].

The incidence of diabetes in African Americans is disproportionate to that of men and women of other races. Poor diabetes self-management related to patients' lack of knowledge regarding the disease process and self-management strategies, compounded by clinicians' lack of teaching, counseling and supervised follow-up for African Americans with diabetes exacerbates the risk. Research demonstrates a lack of use in culturally appropriate educational and evaluation strategies when working with diabetic African-American populations [3].

Background and Significance

From this national scope regarding the challenges of diabetes incidence and care, each state and community reflect the extent of this problem. In North Carolina, diabetes is the fourth leading cause of death among African Americans [4]. Mortality rates in African Americans are 2.7 times higher than mortality in Caucasians in North Carolina [4]. On a more defined scope, African Americans in Cumberland County, North Carolina, diagnosed with diabetes in 2008, ranked the 5th highest in the state at 12.4% [5].

The thrust for better prevention and treatment of diabetes is reflected in the Healthy NC 2020 Objective which aims to "decrease the percentage of adults with diabetes" [6]. The Community and Clinical Connections for Prevention and Health Branch (CCCPH) facilitates diabetes prevention and management using a systematic approach that increases access to behavior management education and supports quality care for people who are at risk of and who have diabetes. Diabetes self-management education is a "recognized strategy to improve quality of life, reduce diabetes complications and reduce costs associated with diabetes care" [5].

Diabetes Self-Management Education (DSME) is a critical element of care for all people with diabetes and is necessary to improve patient outcomes. The national standards for DSME are designed to define quality diabetes self-management education and to assist diabetes educators in a variety of settings to provide evidence-based education. Seven self-care behaviors have been identified as essential for successful and effective diabetes self-management and are incorporated into The National Standards for Diabetes Self-Management Education. These self-care behaviors include healthy eating, physical activity, daily self-monitoring of blood glucose levels, adherence to prescribed medication regimen, problem solving skills to address

barriers, healthy coping and risk reduction by healthy behaviors such as smoking cessation and regular eye, foot and dental exams [7].

Nutritional education and recommendations for patients with diabetes should be individualized. An emphasis on nutrition education is the basis for the healthy eating self-care behavior. Physical activity can improve glycemic control, reduce the risk of cardiovascular disease and improve insulin sensitivity which makes it an important component of diabetes management. Self-monitoring behaviors may prevent or slow the progression of diabetes related complications by improving problem-solving and decision-making skills for patients with diabetes. Problem-solving is recognized as a core component of effective diabetes self-management and facilitates the attainment of each of the other self-management behaviors. The American Association of Diabetes Educators Self-Care Behaviors, which are the theoretical basis for their education provided to diabetic patients [8], are further explained in table 1 (Supplementary Data) [8].

Note: AADE7™ Self-Care Behaviors. Adapted from “AADE Guidelines for the Practice of Diabetes Self-Management Education and Training” by American Association of Diabetes Educators, 2010 [8].

The AADE7™ self-care behaviors support a paradigm shift in DSME from a content-driven practice to an outcomes-driven practice, providing an evidence-based framework for assessment, intervention and outcomes (evaluation) measurement of the diabetes patient, the DSME program and populations. Through use of these self-care behaviors within DSME comprehensive education programs, healthcare providers are able to determine their effectiveness with individuals and populations, compare their performance with established benchmarks, and measure and quantify the unique contribution that DSME makes in the overall context of diabetes care [9].

Diabetes self-management education allows individuals with diabetes to initiate effective self-management and cope with diabetes when they are first diagnosed by combining education related to nutrition, medication compliance and management and exercise. Ongoing DSME and support of the same type also help people with diabetes maintain effective self-management throughout a lifetime with diabetes. In relation to DSME, guiding principles identify that diabetes education is effective for improving clinical outcomes and quality of life. In addition, DSME has evolved from primarily didactic presentations to more theoretically based empowerment models where there is no single best education program or approach; however, programs incorporating behavioral and psychosocial strategies demonstrate improved outcomes.

Behavior management education is vital to the health of diabetics, especially African Americans. The importance of self-surveillance, self-care and self-efficacy is well delineated in the literature as keys to successful client-centered control of T2DM. The foundational support for this is through education programs that empower client to “be the nurse” for themselves, and in doing so, are successful in the management of their T2DM.

To enhance the results of these programs, studies show that culturally sensitive programs improve outcomes and that group education is effective. Ongoing support is critical to sustain progress made by participants during the DSME program [7]. The challenge remains in that research indicates that culturally-tailored DSME improves self-management among racial/ethnic populations [3,10]. Other studies showed that it is difficult to accomplish and is lacking for this

population due to difficulty incorporating behavioral, cultural and psychosocial strategies [11,12].

<p>Healthy eating: Making healthy food choices, understanding portion sizes and learning the best times to eat are central to managing diabetes.</p> <p>Diabetes self-management education and training classes can assist people with diabetes in gaining knowledge about the effect of food on blood glucose, sources of carbohydrates and fat, appropriate meal planning and resources to assist in making food choices. Skills taught include reading labels, planning and preparing meals, measuring foods for portion control, fat control and carbohydrate counting. Barriers, such as environmental triggers and emotional, financial, and cultural factors, are also addressed.</p>
<p>Physical activity: Regular activity is important for overall fitness, weight management and blood glucose control. With appropriate levels of exercise, those with diabetes can improve glycemic control. Being active can also help improve body mass index, enhance weight loss, help control lipids and blood pressure, and reduce stress.</p> <p>Diabetes educators and their patients collaborate to address barriers, such as physical, environmental, psychological, and time limitations. They also work together to develop an appropriate activity plan that balances food and medication with the activity level.</p>
<p>Monitoring: Daily self-monitoring of blood glucose provides people with diabetes the information they need to assess how food, physical activity, and medications affect their blood glucose levels. Monitoring, however, doesn't stop there. People with diabetes also need to regularly check their blood pressure and weight.</p> <p>Diabetes self-management education and training classes instruct patients about equipment choice and selection, timing and frequency of testing, target values, and interpretation and use of results.</p>
<p>Taking medication: Diabetes is a progressive condition. Depending on what type a person has, the APN will be able to determine which medications they should be taking and help them understand how their medications work. The APN can demonstrate how to inject insulin or explain how diabetes pills work and when to take them. Effective drug therapy in combination with healthy lifestyle choices, can lower blood glucose levels, reduce the risk for diabetes complications, and produce other clinical benefits.</p> <p>The goal is for the patient to be knowledgeable about each medication, including its action, side effects, efficacy, toxicity, prescribed dosage, appropriate timing and frequency of administration, effect of missed and delayed doses, and instructions for storage, travel, and safety.</p>
<p>Problem solving: A person with diabetes must keep their problem-solving skills sharp because on any given day, a high or low blood glucose episode or a sick day will require them to make rapid, informed decisions about food, activity, and medications. This skill is continuously put to use because even after decades of living with the disease, stability is never fully attained; the disease is progressive, chronic complications emerge, life situations change, and the patient is aging.</p> <p>Collaboratively, diabetes educators and patients address barriers, such as physical, emotional, cognitive, and financial obstacles and develop coping strategies.</p>
<p>Healthy coping: Health status and quality of life are affected by psychological and social factors. Psychological distress directly affects health and indirectly influences a person's motivation to keep their diabetes in control. When motivation is dampened, the commitments required for effective self-care are difficult to maintain. When barriers seem insurmountable, good intentions alone cannot sustain the behavior. Coping becomes difficult and a person's ability to self-manage their diabetes deteriorates.</p> <p>An important part of the diabetes educator's work is identifying the individual's motivation to change behavior, then helping set achievable behavioral goals and guiding the patient through multiple obstacles. They can provide support by encouraging patients to talk about their concerns and fears and can help them learn what they can control and offer ways for them to cope with what they cannot.</p>
<p>Reducing risks: Effective risk reduction behaviors such as smoking cessation and regular eye, foot, and dental examinations reduce diabetes complications and maximize health and quality of life. An important part of self-care is learning to understand, seek, and regularly obtain an array of preventive services.</p> <p>Diabetes educators assist patients in gaining knowledge about standards of care, therapeutic goals, and preventive care services to decrease risks. Skills taught include smoking cessation, foot inspections, blood pressure monitoring, self-monitoring of blood glucose, aspirin use, and maintenance of personal care records.</p>

Table 1: AADE7™ Self-Care Behaviors.

Diabetes self-management requires personal lifestyle changes and education to manage the condition, but according to the data found in the Burden of Diabetes in North Carolina report by the North Carolina Division of Public Health the proportion of adults with diabetes who reported self-practicing preventive measures, only 53.9% reported attending a diabetes class [5]. Less than 30% reported following the recommendations for physical activity or healthy eating, and only 65% reported performing daily glucose monitoring.

Commonalities of the literature indicate the obvious lack of health literacy among African Americans with diabetes, resulting in decreased or poor self-management of diabetes. Because African Americans with diabetes are exponentially pre-disposed to lifelong complications when compared with other ethnic groups, these findings support the need for improved, patient-centered diabetes educational programs for African Americans with diabetes. Any programs must address these variables in both a culturally appropriate and culturally sensitive manner. In addition, why results of implemented programs have shown that success can be achieved, one trend observed was the lack of culturally based diabetes education programs that identify those cultures with increased risks associated with complications of diabetes, resulting in decreased quality of life and increased morbidity and mortality rates [13-15].

The overall results of the literature reviewed demonstrated that further research is needed to understand interventions that are educational-based and culturally sensitive to increase the knowledge and self-management practices among African Americans diagnosed with T2DM so that there is a reduction in long-term diabetes related complications and an increase in the optimal quality of life [16-19].

Purpose of the Project

The purpose of this project was to provide a culturally sensitive community program that enhanced positive outcomes of common measures that indicate well controlled T2DM in the African American population. The outcome indicator for the project was that: African Americans age 40 and older will demonstrate an increased knowledge of T2DM and improved self-management as evidenced by increased scores on program post-tests of diabetes knowledge, improved blood pressure measurements, decreased weight and decreased finger stick blood glucose levels compared to their baseline data at the start of the program.

Methodology

Design

Resources on the topic of type 2 diabetes utilized in implementation of this project consisted of written and pamphlet information within the organization, teaching materials, props and many reference books. Personnel resources included experience, guidance and knowledge of the health education coordinator, and the ability to utilize the two registered nurses to check participants in upon arrival to class. The registered nurses measured and recorded participants current weight, blood pressure reading and finger stick blood glucose level at each weekly patient encounter.

Sample and setting

A convenience sample of 32 individuals was identified as program participants based on weekly rosters for each class held during the month of the project. Of the 32 participants 16 were excluded because

they did not meet the criteria for race (African American). A total of 15 participants were Caucasian and one was Hispanic. Of the remaining 16 participants 3 were excluded because they did not meet the criteria of class attendance each week for 4 weeks. This resulted in a final convenience sample total of 13 participants. Of the 13 African American participants, 8 were male and 5 were female with an average age of 62, and all had a diagnosis of type 2 diabetes.

The project site was a United Way partner agency located in eastern North Carolina in a city that hosts a melting pot of individuals due to the nearby military base. The mission of the agency was to provide for the unmet healthcare needs of adult county residents with diabetes through assistance, referral and education.

Project design

The evaluation design quality improvement project utilized a programmatic intervention method to educate African Americans age 40 and over with T2DM about improved self-management. Quantitative analysis was accomplished by evaluation of the participant's blood pressure, weight and finger stick blood glucose levels pre-program (week 1) and one-month post-program (week 8), to determine any significant result. The qualitative analysis was accomplished by completion of a program evaluation tool by each participant at the end of week 4.

Method of evaluation

The method of evaluation was based on Kirkpatrick's proposed four levels of evaluation of training programs [20]. The first level was reaction, or the participant's satisfaction with the intervention. This was measured by use of a program evaluation tool where participants rated the program using a Likert scale (Table 2). The second level was learning, where any change in knowledge was noted with completion of the program evaluation tool. The third level was behavior, and this was measured by completion of the program evaluation tool to determine if the participants changed their level of knowledge concerning behaviors related to the program topics. The qualitative results of the program evaluation tool responses were analyzed using descriptive statistics. The fourth and final level of evaluation was results or outcomes. Positive outcomes were evidenced by measurable differences in blood pressure, weight and finger stick blood glucose levels. This quantitative data was evaluated using statistical analysis to compare the participant's baseline variables recorded at the beginning of the program (week 1), and final variables recorded one month after the program (week 8).

Data Analysis

The weekly educational interventions were andragogically designed to incorporate culturally sensitive parameters to enhance the participants understanding and self-management of those entities inherent in this population. Specific learning modules addressed the issues of hypertension, hypercholesterolemia and renal insufficiency as it related to the African American population. In addition, learning modules focused on strategies for healthy eating that incorporated strategies for modifying food preparation that acknowledged the richness of heritage and family "ways of knowing and doing" in dietary practices.

The quantitative data, blood pressure, weight and finger stick blood glucose levels were analyzed for data mean and standard deviation,

as well as paired t-tests to determine if the differences pre-program (week 1) and post-program (week 8) were statistically significant. Qualitative data was compiled from the post program questionnaire and evaluated using descriptive statistics.

Please rate each of the following statements regarding your experience with the educational program. Please use the following scale: 5 = Excellent 4 = Very Good 3 = Good 2 = Fair 1 = Poor					
Question	Excellent 5	Very Good 4	Good 3	Fair 2	Poor 1
The information presented was clear and easy to understand					
The information presented was helpful in teaching me how to better manage my diabetes					
I am likely to recommend this class to a friend or family member with diabetes					
As a result of the information learned in this program, I have made some positive choices to help self-manage my diabetes					
As a result of this program, I have learned that I can still eat some of the foods that I like, but I must find ways to make them healthier to control my blood sugar					

Table 2: Satisfaction Questionnaire: Post-Program Evaluation.

Results & Implications for Practice

Quantitative data was collected over a period of 8 weeks. Variables of blood pressure, weight and finger stick blood glucose levels were entered into an EXCEL spreadsheet to calculate and determine how many participants had a decrease in comparing results of week 1 to week 8. The results indicated 10 out of 13 participants or 76.9%, experienced a reduction in systolic blood pressure, and 9 out of 13 participants, or 69.2%, and experienced a reduction in diastolic blood pressure. Results indicated 11 out of 13 participants or 84.6%, experienced a reduction in weight and 11 out of 13 participants, or 84.6%, and experienced a reduction in finger stick blood glucose levels. These percentage reductions of participant variables far exceed the outcome goal. Of at least 50% of participants experiencing a reduction in weight only over the 8-week period. There was a 4.9% reduction in systolic blood pressure, which correlated to a p value of 0.246. There was a 1.4% reduction in diastolic blood pressure, which correlated to a p value of 0.2645. Results indicated a 1.5% reduction in weight, which correlated to a p value of 0.8390. Finger stick blood glucose level results showed a 16.4% reduction, which correlated to a p value of 0.0112, indicating statistical significance. Qualitative data results showed that all 13 participants were 100% satisfied with the program information, delivery and resulted in achievement of 5 on each question (Table 3).

	Affected Patients	Total Patients	% Affected	% Reduction	p value
Reduction in systolic blood pressure	10	13	76.9%	4.9%	0.246
Reduction in diastolic blood pressure	9	13	69.2%	1.4%	0.2645
Reduction in weight	11	13	84.6%	1.5%	0.8390
Reduction in finger stick blood glucose levels	11	13	84.6%	16.4%	0.0112

Table 3: Reduction in systolic blood pressure, Reduction in diastolic blood pressure, Reduction in weight and Reduction in finger stick blood glucose levels.

Diabetes education should be tailored to patients based on cultural differences instead of a one size fits all approach. Support for self-management of DM2 must be grounded in a culturally sensitive methodology. Studies have shown the negative impact of programs that are not culturally relevant to participants [10,12,21]. In their systematic review of the research into African-American views on DM2 self-management reiterate that a key component of self-management was provision of education and care by health care professionals who understood the participants' cultural backgrounds [3]. The key implication for practice is culturally appropriate education that mirrors the participants' perspectives of diet, activity and self-management capabilities.

Limitations

While the data suggests a positive influence between use of a culturally sensitive educational program for type 2 diabetes patients by reflection of a decrease in blood pressure, weight and finger stick blood glucose levels, the sample size and study time frame was too limited in scope to draw more conclusive results. It is necessary to conduct studies with larger sample sizes to determine if this data can be replicated because it appears that use of a culturally sensitive educational approach may have a positive effect on blood pressure and weight and a significant effect on finger stick blood glucose levels in the African American patients with type 2 diabetes.

Conclusion

Diabetes impacts every facet of society, occurring across all racial/ethnic and socioeconomic groups. Diabetes is a self-managed disease and people with diabetes have to take responsibility for their day-to-day care. This can best be accomplished by integration of culturally appropriate materials and community-based activities related to diabetes that educate, empower and create measurable differences in the prevalence of diabetes and its complications among African Americans in order to create a healthier African American community living with controlled diabetes and remaining free from its long-term complications.

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