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**Purpose:** This study aimed to develop a culture-centered diabetes education program (CCDEP) for Nigerian immigrants to assess knowledge and attitudes on Diabetes Mellitus (DM).

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**Results:** Participants demonstrated more knowledge on DM in the posttest than in the pretest:  $t=9.43$ ,  $df=39$ ,  $(p$

**Conclusions:** The knowledge gained through the CCDEP has the potential to enhance the participants' knowledge base and to shift their attitudes on DM towards better DM care.

**Implications for Practice:** Further research is needed to determine if a causal relationship exists between an increase in knowledge following CCDEP and improved DM outcomes.

## **Document Type**

Thesis

## **Degree Name**

M.S. in Advanced Practice Nursing

## **First Supervisor**

Christine Nelson-Tuttle

## **Second Supervisor**

Nancy Wilk

## **Subject Categories**

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Development of a Culture-Centered Diabetes Education Program for Nigerian Immigrants

By

Gloria Ibezim, RN, BSN

Submitted in partial fulfillment of the requirements for the degree

Master's in Advanced Practice Nursing

Supervised by

Dr. Nancy Wilk & Dr. Christine Nelson-Tuttle

Wegmans School of Nursing

St. John Fisher College

April, 2017

### **Abstract**

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**Results:** Participants demonstrated more knowledge on DM in the posttest than in the pretest:  $t=9.43$ ,  $df=39$ , ( $p<0.001$ ), pre-test ( $M = 4.65$   $SD = 2.54$ ), while posttest ( $M = 8.35$ ,  $SD = 0.98$ ).

**Conclusions:** The knowledge gained through the CCDEP has the potential to enhance the participants' knowledge base and to shift their attitudes on DM towards better DM care.

**Implications for Practice:** Further research is needed to determine if a causal relationship exists between an increase in knowledge following CCDEP and improved DM outcomes.

## Introduction

Diabetes Mellitus (DM) is a serious metabolic disorder (Shah & Vella, 2014). Currently, about 422 million persons have DM worldwide, 29.1 million or 9.3 % are affected in the United States; the prevalence is expected to rise significantly to 592 million by 2035, cutting short life spans by 5 to 10 years (World Health Organization ([WHO], 2016). Nigeria is in West Africa, and a majority of African Americans are Blacks from West Africa. Blacks are 2.2 times more likely to suffer and die from DM than Whites, largely because of the fact that Blacks have inherited traits of substantial amounts of skeletal muscle fiber type II with decreased quantity of skeletal muscle fiber type I; both control fat oxidation and lipid disposal that play major roles in triggering DM (Nielsen & Christensen, 2011). Past studies affirm that engaging culturally-focused diabetes self-management education (DSME) is the best strategy to address this since current programs have not been effective in minority populations (Campbell, Walker, Smalls, & Egede, 2012; Newman, Cheng, Ghahate, Bobelu, & Sandy, 2014; Purcell & Cutchen, 2013). Nigeria is the most populous black nation representing 2.5% of the world's population ("Central Intelligence Agency," 2017), and it has the highest DM mortality rate in Africa (WHO, 2013). The impact of social factors and individual behaviors on beliefs and customs negatively influences the awareness, knowledge, and attitudes of Nigerians and the ways they accept and use information about DM to prevent or manage this "so-called disease of the affluent" (Adejumo et al., 2015; Oguejiofor, Odenigbo, & Onwukwe, 2014; Ojua, Ishor, & Ndom, 2015).

Utilizing a culture-centered diabetes education program (CCDEP) is recommended since existing programs have not helped to improve DM management among minorities, especially in assessing knowledge and attitudes surrounding it (American Diabetes Association ) (ADA ), 2016; WHO, 2016). This DM education program was developed for the Nigerian population in a

medium city in Western New York with the goal of increasing the participants' knowledge base about DM causes, risk factors, signs, symptoms, prevention, and management using healthy practices. The culture-sensitive DM educational program has the potential to cut costs, raise awareness for prevention, and improve DM self-management among the Nigerian population.

### **Background and Significance**

The impact of DM among Nigerians is increasingly becoming more of a concern (Adeniyi, Uloko, Ogwumike, Sanya, & Fasanmade, 2013). Nigerian immigrants mirror Nigeria as a whole, and a major setback in the management of DM among Nigerians is due to the late diagnosis of the disease since symptoms are often ignored; they are ignored because of a lack of awareness of the disease, or they have wrongly associated it with some sort of magic spell from evil spirits. Sufferers are often stigmatized and are hesitant to seek medical help when they first notice symptoms (Fasanmade & Dagogo-Jack, 2015; Oguejiofor et al., 2014). There is a lack of research on DM in this cultural group to date. However, broader research has demonstrated that gaps in knowledge in the care and level of severity of DM among minorities can be abridged with evidence-based, culture-centered diabetes education specifically tailored to people's contexts (ADA, 2017; Choi, Walker, & Palermo, 2016; Fasanmade et al., 2015; Newman et al., 2014; Saleh, Afnan, Ara, Mumu, & Khan, 2017).

The framework for a Chronic Care Model (CCM) for DM care emphasizes a healthcare education program that is culturally sensitive to the people's lifestyles (Dauvrin, Vincent, & d'Hoore, 2015); this promotes greater glycemic improvement in a minority population with diabetes (Nam, Janson, Stotts, Chesla, & Kroon, 2011) by integrating culturally-tailored aspects of DM care, such as dietary choices, ethics, and habits. However, less emphasis has been placed on how minority groups learn best (Choi et al., 2016). The ultimate goal of the CCM is to

provide care that patients are familiar with. These guidelines align with the algorithm for diabetes care (Powers et al., 2015) that are reflected in a position statement accepted by the American Diabetes Association. This white paper reported that the management of diabetes entails the sufferer should make use of available resources to diligently engage in various daily self-management interventions and carry out elaborate care tasks daily. These researchers illustrated two aspects of DM care, namely, Diabetes Self-Management Education and Support (DSME/S) and Diabetes Self-Management Support (DSMS). While DSME/S assists DM patients to practice these protocols, which have been tested and shown to advance DM care with improved outcomes, DSME helps diabetics to use available information and skills needed for diabetes self-care (Powers et al., 2015).

In the Nigerian context, challenges exist to DM care guides chiefly due to insufficient knowledge and skill on both DSMS and DSME/S. Ogbera and Ekpebegh (2014) confirmed this: “traditionally, Nigerians related DM to ‘curses’ or ‘hexes’” (p. 905). Worse still, the diagnosis of DM in some Nigerian rural areas is often made based on the sweetness of urine when tasted, chewing gum melting in the mouth overnight, or ants being attracted to urine. Some ways of self-care entail drinking bitter drinks like stout beer or bitter tasting herbs to neutralize the sugar concentration in the body (Oguejiofo et al., 2014).

The World Health Organization supports both Western medicine and indigenous healers in the management of DM in Nigerian culture. This creates confusion in the sense that most times traditional healers are not evidence-based, and they lack a structured approach to the management of DM (Chinenye & Ogbera, 2013; Fasanmade et al., 2015; Ojua et al., 2015). Unorthodox medicine is often widely and primitively used by persons with DM for an intended cure; and here in the United States, it is common knowledge that some Nigerian immigrants are



still using Nigerian-made, traditionally-brewed herbs as a remedy but fail to seek appropriate help before the harsh realities of complications due to the disease. Fasanmade et al. (2015) found in their study of DM care in Nigeria that an average diabetic Nigerian performs self-blood glucose monitoring 25.4% of the time compared to 60% to 85% adherence by American people. The challenges to better DM self-management includes certain erroneous beliefs and attitudes, medication adherence, knowledge, language ability, ethnicity or culture, financial leverage, and level of social support (Nam et al., 2011).

Daily physical activity with a healthy diet rich in fiber and whole grains is one of the most effective preventive techniques to control the risk factors of DM. In a qualitative visual ethnographic study using photovoice, Turk, Fapohunda, and Zoucha (2015) investigated the awareness and perspectives of Nigerian immigrants regarding healthy dietary habits and physical exercise in the United States. These researchers revealed that Nigerian culture is accustomed to food high in spices and carbohydrates. Nigerians' traditional meals, however, contain a lot of fried food. Medium- to low-glycemic index carbohydrates such as rye, wheat, brown rice, and barley are combined with legumes, peas, beans, and sweet potatoes; non-starchy vegetables like carrots, broccoli, and cucumbers should be included as their food substitutes. The American Diabetes Association (2016) recommends that traditional ingredients should be substituted with healthier food choices (ADA, 2017). Nigerians consider weight gain as a sign of a good life, but healthy food choices are contributing factors to longevity (ADA, 2017; Brathwaite & Lemonde, 2015; Ogbera & Ekpebegh, 2014).

According to Spencer, Kieffer, Valerio, Anderson, and Heisler (2011), culture-centered educational programs from many different disciplines have been effective with diabetes care. The researchers found that insensitivity to CCDEP in addition to providers' poor knowledge of

cultural care, patients' difficulty in debunking preconceived cultural beliefs, going against medical advice, non-adherence to treatment regimen, and indiscrete dietary habits were roadblocks to optimal glucose control (Shattell et al., 2013; Saleh et al., 2017).

Engaging health workers who speak the native language of the minority group enhances communication with members of the community, and this results in better intervention outcomes (Pottie, Hadi, Chen, Welch, & Hawthorne, 2013). This strategy motivated participants to remain in diabetes education programs in order to attain positive effects. In a similar study, Turk, Fapohunda, and Zoucha (2015) found that most immigrants shy away from having meaningful interactions, like enrolling in group exercise or joining support groups, due to staff unfamiliarity with the participants' cultural milieu. The availability of social and health events that involve familiar people with similar backgrounds helped to improve their general health status. This corroborated Cai and Hu's (2016) findings that specifically tailored educational interventions to the cultural group resulted in greater reductions in HBA1C, body mass index, waist circumference, and general improvements in DM self-management when compared with those in the control group who received routine DM care (Cai & Hu, 2016).

Contrary to the notion that Nigerians consider physical exercise as wasting time since they are always busy, researchers found that family physical activities such as indoor or outdoor play were beneficial to health and were used as a forum to promote social interactions, which provided participants the opportunity to share their perspectives on health problems (Adeniyi et al., 2013; Purcell et al., 2013). Group diabetes education that involved family members were more impactful because each family member learned and strengthened one another in putting into action the skills gained from DSME. This has been shown to be helpful in stress reduction since 55% of the study's participants deemed diabetes to be a shared burden on the sufferer,

family, and the community at large (Adejumo et al., 2015; McElfish et al., 2015).

Ethnic minority groups in the United States have a greater risk of health problems secondary to DM; Campbell, Walker, Smalls, and Egede (2012) conducted a systematic review to investigate ethnic variations in self-monitoring and outcomes in adults with type 2 diabetes. The data collected confirmed that clinical outcomes of minorities continue to fall below expectations. This is a huge concern because DM has many long- and short-term consequences, including cardiovascular diseases, end-stage renal disease, hospitalization for diabetic ketoacidosis, visual impairment, sexual dysfunction, lower extremity conditions especially amputation, high incidence of depression, and untimely deaths (Newman et al., 2012). DM causes significant healthcare costs due to complications that were estimated to be \$249 billion annually in the United States. The researchers concluded that educational programs work best if the patient has a good grasp of information and keeps an open-mind towards acquiring knowledge of the disease (ADA, 2013).

### **Purpose**

The purpose of this study was to establish an evidence-based, culture-centered educational program directed towards Nigerian immigrants to assess knowledge and attitudes surrounding DM.

### **Methodology**

#### **Study Design**

This study was a single-group interventional pre- and posttest design that presented culture-based diabetes education to a convenience sample of Nigerian immigrants in a city in Western New York. This educational program utilized a module based on an algorithm for diabetes care (Powers et al., 2015) that was developed by this researcher for Nigerian immigrants to assess

knowledge and attitudes about diabetes. This culture-based educational program utilized a PowerPoint format and hard copies to disseminate the information. Participants who agreed to participate completed a pre- and posttest to evaluate levels of DM knowledge and attitudes before and after the education interventions.

### **Ethics Approval**

The Institutional Review Board at the college where the researcher was a student approved the study. Experts in the field reviewed the content of the educational program for content validity. The content experts included a faculty member from the researcher's college who works as a nurse practitioner in the clinical setting with Nigerian immigrants, and a board-certified endocrinologist who is also a diabetes specialist working with Nigerian immigrants. A letter of introduction was sent to the independent reviewers to inform them about the scope of the educational module and to confirm their willingness to participate. Their expertise would ensure the educational program had accurate, reliable, and useful information appropriate for the teaching and learning styles of the audience.

The researcher used a survey instrument consisting of five questions on a Likert-type scale ranging from strongly disagree to strongly agree. The questions addressed the presentation method, the content of the educational program, the appropriateness and usefulness to the target audience, and any cultural, ethnic, or religious biases. A section for comments and recommendations for changes was provided. Their recommendations were reviewed and incorporated in the final educational package, which was made available to Nigerian immigrants

The educational module included content covering all of the questions in the pre- and posttest questionnaires: the reason for focusing on DM, causes, risk factors, prevention and control of DM, dietary practices, beliefs, stress management, and physical activities. Microsoft Excel statistical software was used to analyze the data from the pre- and posttests to determine

whether there was an educational benefit that Nigerian immigrants received from the intervention.

### **Sample**

A convenience sample of Nigerian immigrants was invited to participate in the study through word of mouth, fliers, and announcements during the Nigerian Association of Greater Rochester's meetings. The inclusion criteria consisted of Nigerian immigrants aged 18 years and older regardless of their levels of education, gender, or health status (diabetics or non-diabetics), and the ability to read and write in English. The exclusion criteria were those under the age of 18, non-Nigerian, and the inability to read and write in English. All participants were given informed consent forms, instructions outlining the study design, and a pretest to be taken prior to the education module. All participants volunteered to complete the study at the same time during the study, and participants were de-identified using numbers. Upon completion, time was allowed for questions from the participants, which was followed by the posttest.

### **Results**

A total of 40 Nigerian immigrants participated in the study: 25 males and 15 females. The majority of the participants were between 31 and 44 years of age (35%), and only 15% of the participants were above 65 years of age. In addition, 34 (85%) of the participants were non-diabetics, while 6 (15%) were diabetics. A paired samples t-test was used to test for differences between the pretest and posttest scores. A significant mean difference in scores was found: ( $t=9.43$ ,  $df=39$ , with a P value of  $<0.001$ ). The difference was such that the mean on the pretest ( $M = 4.65$   $SD = 2.54$ ) was lower than the mean on the posttest ( $M = 8.35$ ,  $SD = 0.98$ ). This indicated that knowledge did increase, as intended, from the pretest to posttest. It was interesting to note that the standard deviation was larger for the pretest than for the posttest, which indicated

that there was a wider variation in knowledge prior to the intervention than after. On average, respondents answered 6.5 questions correctly during the pretest compared to 8.35 during the posttest. This difference was not due to chance; therefore, the education intervention was successful in advancing the knowledge and attitudes of the participants.

A Pearson correlation coefficient compared the relationship between participants' diabetes status, their acquisition of knowledge during the education program, and the difference in scores obtained. A positive correlation was found between participants' diabetes status and pretest and posttest scores (Kendall's tau-b=.20, p=.12). The respondents who had diabetes gained more knowledge than those who were not diabetic. Participants who were diabetic showed keener interest in acquiring expected knowledge regarding management of the disease; they scored higher in the posttest than in the pretest compared to those who were not diabetic.

### **Discussion**

On implementation of the culture-oriented educational program, a significant improvement was observed in knowledge and attitudes of the participants towards diabetes in each perspective. The CCM was implemented by using an educational module that mirrored the participants' lifestyles and culture as recommended by Dauvrin et al. (2015) and the ADA (2013). This study demonstrated that a culturally-focused, structured, and group-based DSME program could effectively improve participants' DM care more than conventional, routine DSME, as in agreement with previous studies (Adejumo et al., 2015; Essien et al., 2017; Power et al., 2015). These findings were consistent with findings of Cai et al. (2016) who utilized a pretest and posttest interventional approach on Chinese minorities and found that the intervention group demonstrated improved

knowledge after undertaking the culturally appropriate educational program. Similarly, Saleh et al. (2017) observed significant changes in a pretest and posttest CCDEP in Bangladesh and concluded that both group and individualized training programs played a fundamental role in helping patients develop positive attitudes towards the disease. The researchers affirmed that patients were able to manage their activities more effectively when they had the knowledge and right attitudes toward the disease (Cai et al., 2016; Saleh et al., 2017)

Furthermore, improvement in knowledge concerning diabetes was noted in participants who were diabetic in this current study. A causal relationship was noted; a positive correlation was found between participants' diabetes status and pretest and posttest scores. This demonstrated that those who had diabetes gained more knowledge than those who were not diabetic. This finding was consistent with the previous studies by Fasanmade et al. (2015) in Nigeria who found that current sufferers of DM showed more interest in matters concerning disease management. The correlation between diabetes status and improvement of knowledge after the education intervention could have far-reaching effects in terms of shaping the patients' attitudes toward diabetes. More specifically, knowledge of symptoms, treatment, and management can enable patients to understand the importance of self-monitoring. Families with first degree relatives with DM learned that beginning from 12 years it is necessary to monitor HBAIC for timely intervention for DM. The education intervention that was used in the present study was designed to meet the needs of the minority group. In particular, aspects of DM management like checking glucose levels in blood, engaging in regular exercise, and avoiding going to traditional healers underscored the importance of culturally-based health-training in enhancing self-care activities and encouraging healthy living. Patients are able to manage their activities more

effectively when they have the knowledge and right attitudes toward the disease. This agrees with Spencer et al. (2011) as participants have been empowered on how to improve DM care. More importantly, experts recommend that patients must engage closely with educators in order to gain requisite knowledge, which may guide them in managing DM. Education plays an important role in bridging the gap between disease information and effective disease management practices.

Consistent with Campbell et al. (2012), this study also found that some participants did not know the signs and symptoms of DM some believed that DM was caused by evil spirits, and that exercise was only for children. Prior to the posttest, they never considered exercising. However, their responses in the posttest showed a significant improvement in change of attitudes toward exercising. The posttest results indicated that participants had accurate (>90 percent) knowledge of DM including causes, symptoms, prevention, and general disease management. These practices included acquiring good cultural habits, adopting positive attitudes, exercising, choosing healthier foods, and avoiding stress. It is likely that the knowledge gained through the educational program has the potential to lower the rate of complications, morbidity, and mortality due to DM by achieving optimal blood glucose control (Newman et al., 2014).

### **Implications for Future Research**

Currently in the United States, researchers are trying to find ways to improve awareness of DM among various cultural groups. Culture-centered awareness programs are demonstrating successful results among all the programs that have been tested (Cai et al., 2016; Tucker et al., 2014). Culturally-sensitive health education programs play a fundamental role in advancing minority populations' knowledge regarding management of health and the importance of disease prevention habits like regular exercise, good eating



habits, and a positive attitude toward the disease. Longitudinal studies may be warranted to relate CCDEP to improved care and decreased DM complications. Hospitals, health organizations, and funding agencies are urged to support this kind of research and to make it a priority since it is less expensive to implement when compared to the cost of managing DM complications. Further research is needed to determine whether this increase in knowledge translates into improved DM outcomes. This study highlighted the need for future investigations of health beliefs and cultural practices of other high-risk minorities to decrease rates of misleading health information. The fact that WHO supports Nigerians using traditional healers for DM care also needs to be re-examined since traditional healers have not been studied.

### **Limitations**

The major limitation of this study was the relatively small convenience sample of 40 Nigerian immigrants. Difficulties in motivating Nigerians to not hide their DM diagnoses due to avoidance of stigmatization in the community also gave rise to maintaining their privacy. Such missing information could be essential for future health planning.

### **Conclusion**

A culture-centered diabetes education program is one step in improving the health of Nigerian immigrants. Nigerian immigrants who participated in this research demonstrated an increase in knowledge on the causes, risk factors, signs and symptoms, and how to prevent and control DM. They also learned healthy dietary practices and why they should reject certain false beliefs. Stress-management strategies and physical activities suitable for DM management were also learned and have the potential for

significant improvement in DM care, thus decreasing mortality in this population.

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