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Diabetes Education Tailored Towards English Speaking Caribbean Immigrants

Joanna A. Dunk
Walden University

Walden University

College of Health Sciences

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Joanna Dunk

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Review Committee
Dr. Cathleen Colleran-Santos, Committee Chairperson, Health Services Faculty
Dr. Debra Wilson, Committee Member, Health Services Faculty
Dr. Dana Leach, University Reviewer, Health Services Faculty

Chief Academic Officer
Eric Riedel, Ph.D.

Walden University
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Abstract

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MSN, Florida International University, 2010

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Project Submitted in Fulfillment

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Abstract

The prevalence of diabetes is increasing among persons of Caribbean ancestry in the United States, yet there is little research on the differences in the health and nutrition patterns of diabetics from this population. This study created a culturally-sensitive diabetes education program for the staff of an internal medicine practice that treated patients from the English-speaking Caribbean. The project was guided by the health belief model, as well as Leininger's theory of transcultural nursing. Methodology of project had a quality improvement focus. The comprehensive curriculum included diabetes medications, physical activity, culturally-tailored medical nutrition therapy, complications, self-care behavior, problem solving, and goals. Tools incorporated into the program included DVD, self-learning power point modules, and staff and patient education materials. The diabetes education program was introduced to 16 members of the internal medicine staff, chosen by the physician. A question and answer session was included, during which medical personnel articulated satisfaction with the program. Also verbalized was their increased understanding of diabetes education, and medical nutrition therapy tailored towards English-speaking Caribbean diabetics. The implication for social change indicates that in order for patients of the target population to receive quality, culturally-specific diabetes education, medical personnel must receive structured culturally-tailored diabetes education. Education translated into evidence-based patient education and practices. Program evaluation can be undertaken by monitoring staff and patient satisfaction, and improved patients' hemoglobin A1C.

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Dedication

This DNP project is dedicated first and foremost to My Lord and Savior, Jesus Christ. This project is also dedicated to my parents Arthur and Gerda Dunk, my siblings Andrea, Arthur Jnr, Audley, Gary, Orville, and John, sisters-in law, nieces, nephews, cousins, and grandparents.

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Section 1: Nature of the Project

Introduction

There are an estimated 347 million people living with diabetes worldwide. Diabetes is projected to be the seventh leading cause of death in 2030 (World Health Organization [WHO], 2013). In 2012, 9.3% or 29.1 million Americans were reported as having diabetes of this number 8.1 million were undiagnosed. By race/ethnicity there were 7.65 non-Hispanic Whites, 9.0% Asian Americans and 13.2% non-Hispanic Blacks. In 2012 there were 1.7 million reported cases of newly diagnoses diabetics (Centers for Disease Control and Prevention [CDC], 2014). On average, life expectancy is reduced by more than 20 years in persons diagnosed with Type 1 diabetes and up to 10 years for those with Type 2 diabetes (Diabetes UK, 2010).

The clinical diagnosis of diabetes may occur more than 10 years after the onset of noninsulin diabetes (Portia et al., 2014). Other estimates have placed the time between onset and diagnosis at 6-12 years (Harris, Klein, Welborn, & Knuman, 1992). By the time of diagnosis the patient may already exhibit microvascular and macrovascular complications of the disease (Caribbean Health Research Council, 2006). This chronic disease is associated with short term complications of hypoglycemia, hyperglycemia and hypertension. Long term complications are microvascular and macrovascular in nature and increase mortality. In 2010 diabetes was the seventh leading cause of death in the United States; however, this is thought to be underreported because of associated complications that are a more direct risk of mortality. Thirty-five percent to 40% of diabetics who died did not have the disease listed on their death certificate (CDC, 2014).

The ramification of diabetes has both financial and quality of life consequences. The cost of caring for diabetes in 2012 in the United States in both direct and indirect cost was $245 billion (American Diabetes Association, 2014). Costs included medical, disability, work loss and premature death (CDC, 2014). Yearly expenditure related to diabetes is estimated to be $13,000 per individual, expenses that are twice that of non-diabetics (ADA, 2013).

Problem Statement

There are insufficiently cultural sensitive diabetic educational programs for English-speaking Caribbean immigrants, clearly making this a problem in treatment and self care of this chronic disease. Diabetes is a preventable disease and its prevalence is increasing in the minority ethnic population and in those socioeconomic disadvantaged members of society (Beckles, Zhu, & Moonesinghe, 2011). There are approximately 2.7 million persons of Caribbean ancestry residing in the United States (United States Census Bureau, 2013). Few researches investigated the differences in health and nutrition patterns of persons of Afro Caribbean descent (Davis & Huffman, 2006). The current nutrition model is culturally biased and does not accommodate the food habits of persons from the English-speaking Caribbean. Immigrants from the English-speaking Caribbean and those persons of Caribbean descent have need for quality sensitive and competent education. Culturally sensitive and competent education can serve to improve diabetes self-management, improve glycemic control, and decrease complications.

The creation of an education program for medical personnel supports professional development by increasing their knowledge. Professional development enables the

sustainment and support of new practices until it converts into regular practice (Nishimura, 2014). Evidence-based patient education requires that health care personnel have communication and teaching skills to counsel and motivate patients. Diabetic education and the adoption of diabetes self-management behavior is an integral component of disease management and lasting positive clinical outcomes. Blood glucose control is important in the prevention of diabetes complications; however, environmental, socioeconomic, and provider and patient associated barriers can cause increased difficulty is achieving glucose control (Kutob et al., 2013). The development of a diabetic education program tailored towards English-speaking Caribbean immigrants required the acknowledgement that there were inherent challenges that needed to be addressed. These challenges were overcome through planning and design. Development of a self-management education program requires formal design and clearly delineated timeline. Problem statements, goals, objectives, and the methods of achieving goals were defined. In designing the program care was taken to include services that serve to facilitate education, improve glycemic control and self-care practices. Cultural, socioeconomic status, and barriers to education were of paramount importance.

Education empowers diabetics to manage their illness, cope with stressors, and make decisions that are appropriate towards their care. The purpose of the DNP project was the development of a culturally tailored diabetes education program of English-speaking Caribbean immigrants for medical personnel in an internal medicine practice in Plantation, Florida. Plantation is located in Broward County and the county has a diverse ethnic background with persons from more than 71 countries. Persons of West Indian

heritage are the most widely represented, followed by persons of Italian, Irish, American and German heritage (Broward.org, n.d.). Population of the English-speaking Caribbean comprises of persons from African, Asian, Middle-Eastern, European, and East Indian descent. It is therefore important to ascertain the amount of representation from each group.

The diversity of the population is reflected in the beliefs and diet of the region that have created a cultural melting pot. This melting pot of beliefs and culture is intertwined, and complementary. Problem statement identified is without structured culturally tailored diabetes education Type 2 diabetes is a costly chronic health condition which remains uncontrolled.

Purpose Statement

The purpose of this project was to improve medical personnel knowledge of diabetes, the culture of English-speaking immigrants and patient diabetes self-management through the use of culturally relevant diabetic education. The goal of structured diabetes education was to assist medical personnel with knowledge and skills required for glycemic monitoring, medication adherence, dietary adherence and physical activities. This would then form the framework for medical personnel to use in the education, treatment, and management of diabetic patients from the English-speaking Caribbean. In order to achieve this goal it was of utmost importance to integrate cultural components into diabetes education program targeted to ethnically diverse patient population (American Association of Diabetes Educators [AADE], 2011). Culture, food, and beliefs affect the health and wellbeing of the patient. As an important component of

diabetes education is an understanding of the various cultural and ethnic nuances these were addressed. An understanding of the link between cultural food practices and diabetes among the targeted population must be achieved (Goody & Drago, 2009). Caribbean immigrants and persons of Caribbean descent possess different health perceptions, behaviors, beliefs, and dietary habits from United States born patients. These differences influence self- management and serum glucose levels. Staff at the internal medicine practice felt ill-equipped to provide education tailored to this population. Education provided in the practice provided the "one size fits all" approach and excluded cultural distinctions. Patients and medical staff, who are inadequately equipped to manage the disease, result in patients demonstrating poor glycemic control, increased complications and mortality.

Patients are the central component of diabetes education. It is the patient who has the difficult task of managing their illness on a daily basis. Most diabetics need support in order to gain crucial skills, confidence and knowledge needed to attain self-management (Sunart et al., 2011). The role of the educator is to ensure that the patient's work is made easier (Haas et al., 2014). Patients of different cultures and ethnicity by nature of their differences can hinder effective communication. Effectiveness of communication between health care personnel and patient is essential to patient education, information recall, treatment adherence and health outcomes (McAlinden, 2014). Patient-centered communication positively impacts adherence to treatment, and clinical outcomes in diabetes management (Levinson, Lesser, & Epstein, 2010).

An obstacle that impedes culturally competent diabetes education is a lack of cultural humility. Cultural humility is defined as a "process that requires humility as individuals continually engage in self-reflection and self-critique as lifelong learners and reflective practitioners" (AADE, 2011, p. 139). This process requires that health care personnel find a common ground with their patients. Finding a common ground facilitates health care personnel-patient relationship by valuing what is important to the patient.

Project Objectives

The project was developed in order to achieve the following cultural sensitive objectives geared towards educating, and treating English-speaking Caribbean Type 2 diabetic immigrants.

- To evaluate the internal medicine practice's current diabetes education program and develop quality improvement initiatives
- Develop an education program that improves medical personnel understanding of cultural sensitive diabetes education, patients' diabetes control and self management
- Improvement of staff's diabetes knowledge, cultural sensitivity and support to diabetic patients
- Development of integrated approaches to diabetes management
- Promotion and adaptation of health care policies that improve the care of diabetic patients.

Research Question Will the use of a structured diabetes education program for medical personnel increase their knowledge of diabetes management?

Project Statement

Development of a structured education program for medical personnel caring for English-speaking patients of Caribbean descent diagnosed with diabetes, in an effort to improve patient diabetes self-management.

Relevance to Practice

Diabetes self-management requires that patients abide to a multifaceted regimen (Grzywacz et al., 2012). This complex regimen entails a lifelong commitment to improved health outcomes. Diabetes self-management education is the cornerstone of diabetes treatment. The regimen includes exercise, stress management, nutrition, and blood glucose monitoring. Education facilitates the development of skills that will assist patients to improve diabetes self-management, cope with stressors, and make appropriate decisions. Ethnic differences in diabetic beliefs relates to self-management behaviors which lie behind ethnic and racial differences in glucose control (Grzywacz et al., 2012). Moss and McDowell (2005) cited that a belief shared by English-speaking Caribbean diabetics is in the use of an assortment of herbal, folk medicine and specific foods to treat diabetes. A strong reliance on religious influence also forms the basis of treatment. Findings from the study proposes that adherence to conventional treatment is affected by religious beliefs, knowledge of diabetes, and perceived severity of disease. A lack of knowledge of these cultural beliefs and practice issues frustrates health care providers and patient alike. Impaired understanding of cultural nuances of English-speaking

Caribbean immigrants supported the theory that in order to design more effective diabetes self-management education care had to be developed in order to gain an understanding the culture of the targeted population. This method was tailored to the characteristics shared by the specific group and specific needs of the cultural group.

Significance of the Project

Persons of Caribbean descent are the recipients of health care in a society strongly influenced by the mainstream American or African-American principles and standards. This health care is oftentimes different from their underlying beliefs and practices (Archibald, 2011). Diabetes actions are swayed by culture and lifestyle, including food choices, the use of folk remedies and religious beliefs. There are numerous studies concerning the effect of diabetes education on measurable metabolic outcomes. There has been difficulty in ascertaining the impact of education to diabetes quality of life and lifestyle changes in the absence of measurable metabolic evidence. This is because evaluations have relied on measurable metabolic evidence that is HbA1C and lipids and less on quality of life, knowledge, and patient viewpoint (Colagiuri & Eigenmann, 2009). Diabetes education has led to improved glycemic control. In a study of education provided to type 2 diabetics in Turkey education had a positive effect on metabolic values as evidenced by lowered HbA1c, triglyceride and total cholesterol (Mollaoglu & Beyazit, 2009). The translation of evidence into practice is an essential instrument and demonstrates how change in practice can improve HbA1c and self-management. This approach can strengthen the delivery of health care and improve practices. The project was tailored to the education of medical personnel to facilitate them receiving the

necessary tools for providing diabetes education to the target patient population. The result of subsequent patient education, by means of HbA1c; a measurable metabolic long range goal was not accomplished in the proposed project. Time constraints did not provide for the use of HbA1c. It was for this reason that the project did not use the traditional measureable outcome of HbA1c to validate the impact of culturally tailored diabetes education on the patients in the practice.

Implication for Social Change in Practice

In the internal medicine practice in Plantation, Florida the patient population consists of African Americans, Caucasian Americans, and persons of English-speaking Caribbean descent. The current practice in this internal medicine practice revealed unavailability of printed educational material, no structured diabetes education, and inadequate diabetes knowledge by non-physician medical personnel. Patient education was the sole responsibility of the physicians. The usual care provided to diabetics involved interaction between the provider and patient which lasted for approximately 15-20 minutes where the former instructed the patient about their medication (name, dose, and frequency). Results of diagnostic tests were provided and explained, and patients instructed to limit carbohydrates in their diet, increase exercise and perform self-glucose monitoring.

In the aforementioned internal medicine practice providers believed that they were equipped to impart diabetes education to their patient base. Patients were therefore not referred to formal diabetes education programs. While the education provide by certified diabetes educators is optimum, on average most patients are not recipients of

this service. A study in Belgium into the reasons for non-referral to diabetes self-management programs cited negative cost-benefit analysis, increased workload associate with administrative procedures, consultation time required to motivate patients, and no perceived value of a diabetes educator (Sunart et al., 2011). Lack of patient involvement and non-attendance in DSME classes was cited by a survey undertaken in Maine. These included inconvenient timing of classes, work and class conflict, lack of transportation, lack of insurance coverage, and belief that DSME classes were unnecessary (Maine Department of Health and Human Services, 2006). These reasons made it imperative for the development of a structured diabetes education program that could then be replicated in other practices.

The education in the practice was delivered in an unstructured and non-systematic manner, and written educational materials were not provided. Non-physician medical staff duties in this specific practice were limited to obtaining vitals, placing patients in the examining rooms and maintaining office flow. Non-physician medical personnel were not members of the education team. Based on the practice of this particular practice it was reasonable to believe that the lack of integrating other medical personnel into patient education occurred in other medical practices.

The implication for social change in the practice indicated that in order for patients of the target population to receive quality, culturally specific education medical personnel had to become the recipient a structured culturally tailored diabetes education program. This education could then be translated into evidence-based patient education and practices. In a visit that spans 15-20 minutes physicians have limited availability to

provide quality education. Medical personnel are valuable assets whose full potentials were not maximized. Once medical personnel attained knowledge in the education and care of diabetes patients' then time spent by patients in the waiting and examining rooms were better utilized to provide patient education.

The relationship between medical personnel and patients is developed by including staff in the education process. Provision of diabetes education program for staff assisted in the expansion of their role in the practice with their inclusion in the education process. The proposed expanded role included orchestration of individual visits, assisting patients in goal setting, diabetes education reinforcement, and provision of follow up to reinforce teaching. Involving staff in the education process decreased the burden on the primary care physicians; provided additional opportunities for patients to receive individual education, and the deliverance of preventative care. The education of medical personnel/staff in culturally sensitive diabetes education to persons of Caribbean ancestry had practical application in the internal medicine practice. It is reasonable to believe that this will hold true for other internal medicine practices.

Definitions of Terms:

Cultural competency: The sensitivity to the cultural, philosophical, religious, and social preferences of persons of various nationalities and ethnicity (Venes, 2013).

Cultural humility: " Process that requires humility as individuals continually engage in self-reflection and self-critique as lifelong learners and reflective practitioners" (AADE, 2011, p. 139).

Empowerment : Participating actively and autonomously in policies or events that affect one's health or well-being (Venes, 2013).

HbA1c: Glycosylated hemoglobin, elevated levels suggest poor long-term glucose control (Venes, 2013).

Shared-decision making: Negotiated agreement between a patient, his or her family, and health care professionals negotiated agreement between a patient, his or her family, and health care professionals (Venes, 2013).

Tailoring: The use of individual level information to create a personal health program or treatment plan

Assumptions and Limitations

The expectation of the physician and staff of the internal medicine practice was that staff achieved competency in culturally sensitive diabetes education. The education can then be used to educate diabetes patients from the English-speaking Caribbean. The physicians and staff expressed concern about the decreased diabetic knowledge of the patients, poor glycemic control, lack of demonstration of self-management skills, and elevated HbA1c levels. They were also concerned that they were ill-equipped to rectify these patient related situations because of their own deficiency related to culturally sensitive diabetes education. Education that had previously been provided to the targeted population had not resulted in a positive impact on patient diabetes self-management behaviors and decreased HbA1c.

The lack of improved patient outcome provided evidence for the need for structured education that included diet, medications, activities and the use of teaching

aides. Aids included printed education literature, a PowerPoint culturally tailored diabetes education module and the use of audio-visual device, that is, DVD. The intent was to provide staff the opportunity to participate in the education program. Participants were allowed 1 week to complete the self-directed diabetes education.

A limitation of the program for the particular practice was financial constraints. There were limited resources for the purchase of educational material. Time constraint was another limitation identified, educating medical personnel during office hours without disrupting the day to day operations of the practice. In an effort to prevent this from occurring the physicians had made the decision to not begin seeing patients until 0900 for that assigned week. This agreement was upheld and for the allocated week medical personnel had uninterrupted time to accomplish the assigned culturally-sensitive diabetes education.

For other practices analysis would have to be undertaken to determine the best time for conducting the education. Another limitation was that the practice did not use electronic medical record and therefore the identification of diabetic patients was hindered. The former reason was instrumental in the decision to not include patients in the education project.

Summary

Culturally competent diabetic education for English speaking Caribbean immigrants and persons of Caribbean descent is critical in achieving glycemic control and effective diabetes self-management practices. Education that addresses the beliefs, cultural and dietary practices unique to this population poses challenges for persons who

are unfamiliar with persons from the Caribbean. Health care personnel are challenged with tailoring the education. In the provision of care medical personnel who have limited training in diabetes, are ill-equipped to educate this population.

The literature illustrates that there is less consistency in the self-management of diabetes among ethnic minorities. This inconsistency and lack of adherence are contributing factors in disease burden and medical complications (Grzywacz et al., 2012). Persons from the Caribbean residing in the United States utilize the usage of folk, herbal medicine, and culturally specific foods in the treatment of Type 2 diabetes. These treatments are taken in conjunction with conventional medicine or patients may make the decision to cease taking medications prescribed for them by their physicians (Moss & McDowell, 2005).

The use of education in patient care is useful in achieving the desired patient outcomes. Therefore the intent of the project was the development for the staff of the internal medicine practice a quality cultural sensitive diabetic education program geared towards English-speaking Caribbean diabetics. The long term goal is that the education received will be used to educate the targeted diabetic patients.

Section 2: Review of Literature and Theoretical and Conceptual Framework

Specific Literature

In the literature search there are articles on the benefits of diabetes self-management education and its effect on HbA1c. Culturally-specific education articles primarily referred to the Hispanic and African American culture. Articles on diabetes education in the Caribbean community were lacking. The majority of articles focused on the development and implementation of diabetes education.

CINAHL and MEDLINE were the two computerized research data accessed. Keywords that were used in the search to obtain the articles reviewed were: *diabetes, Caribbean, education, glycemic control, glycosylated hemoglobin, HbA1c, culture, ethnic, ethnicity, communication, diet, barrier,* and *diabetes self-management*. A total of 100 articles were identified of which 15 were selected for literature review. There were an abundance of articles that discuss the effects of diabetes self-management programs on patient outcomes. However, when the search was limited to cultural sensitive and tailored education the choices were further limited. Available research was further decreased when the Caribbean population was included into the search. When the words "*diabetes education*" along with "*Afro-Caribbean*" were inputted there was one matched article. Studies of educational interventions with subjects age 18 or older were included in the review. Research studies that were not published in English were excluded, as well as studies of gestational diabetes. Studies that provided insufficient information concerning the type of program and intervention were also excluded. Interventions that did not report on biometric measures were excluded.

In a study of first year student pharmacists who participated in a diabetes self-care education program found an improvement in their knowledge and confidence in providing education (Morello et al., 2013). The study included 154 student pharmacists participated in a nine hour program that included lectures, workshops and a home glucose monitor assignment. The confidence improved slightly and tests score of knowledge improved by forty percent respectively.

Whitley and Parton (2014) used the adaptation of a classroom assessment technique to a diabetes program in clinical pharmacy skills and its effects on student knowledge retention. The classroom adaption techniques were easily adapted and with repeated use resulted in demonstrable knowledge retention. Twenty-three student pharmacists received DSME from pharmacy faculty. They then organized and taught DSME classes at a student run free medical clinic. Their confidence increased in diabetes knowledge, counselling skills, disease process, physical ability, diabetes medications, acute and chronic diabetes complications, psychosocial issues, health promotion, and medical nutrition therapy.

DeLea, Shrader and Phillips (2010) performed a study that assessed the confidence and attitudes of pharmacy students about type 2 diabetes and DSME prior to and post participation in a one week simulation about living with diabetes. The students participated in lectures, interactive sessions and a 1 week simulation of living with diabetes. Participation in the Living With Diabetes Week simulation produced increased confidence in students' diabetes education skills and their ability to provide suitable education to those patients diagnosed with diabetes (DeLea et al., 2010).

Fernandes, et al. (2010) explored the use of the U.S Diabetes Conversion Map Education Program and the effect of traditional individual education versus that of group education. The study consisted of 623 Type 2 diabetics who did not have optimal control of their disease. The group therapy occurred weekly and lasted for 4 weeks. The MAP program comprised of six components; visual map, questions to be used in a conversation, discussion cards, facilitation, group interaction, and action plan (Fernandes et al., 2010). Topics covered an overview of diabetes, the relationship between food and diabetes and approaches for eating healthy, glucose monitoring, stress, and complication of the disease. Group therapy allowed for open discussion and increased interaction between diabetic educators and patients.

Davis, Peterson, Rothschild, and Resnicow (2011) explored the use of a diabetes management intervention tailored towards Mexican Americans. Two hundred and eighty-eight study participants were surveyed via telephone and their beliefs, preference of intervention, and acculturation was assessed. The study participants voiced their preference for a program for Mexican American. Religious beliefs were incorporated into their health care. Davis et al. determined that tailoring had the potential to elicit behavior changes include improved glycemic control and building self-efficacy. The study validated the need for the cultural tailoring to obtain optimal effectiveness of diabetes intervention.

Smith (2012) administered a 53 item cultural belief questionnaire to 30 Afro-Caribbean women residing in South Florida. The findings highlighted the struggles faced by the women to adapt their traditional Caribbean diet into a diabetic appropriate diet.

The women were consistent in their beliefs of the efficacy of traditional medicine and prayer in the treatment of their disease. The conclusions derived from the study support the need for health care provider to utilize culturally appropriate dietary guidance (Smith, 2011). Smith suggested that providers incorporate questioning their patients about the use of folk medicine into their practice.

A church- based diabetes self-management education program geared towards the African-American community was undertaken. The study participants included 10 women and two men. At the inception of the study there was not a good understanding between nutrition and diabetes (Collins-McNeil et al., 2012). The education provided resulted in improved medication adherence, foot care and eating habits. In this study the changes in HbA1c were not significant and therefore HbA1c results were not mentioned. Intervention used in the intervention included instructions on coping skills, physical activities, stress management and diabetes education.

Mohamed, Al-Lenjawi, Amuna, Zotor, and Elmahdi (2013) undertook a 12 months study to assess the effectiveness of culturally sensitive structured education among Type 2 diabetics living in Doha, Qatar. A total of 430 Arabs were enrolled in the study, the subjects were randomly enrolled into a controlled or intervention group. The intervention group received education that had its basis in empowerment and health belief models. Diabetic education included pathophysiology, healthy lifestyle incorporation, benefits of exercise, attitude, and practices. Culturally sensitivity was related to the Arabic language, health beliefs, and dietary habits. After twelve months there was a significant reduction in HbA1c (-0.55 mmol/L, $P = 0.012$) and fasting glucose levels (-

0.92 mmol/L, P=0.022). Those persons who comprised the intervention group demonstrated improvement in knowledge of the disease, attitude and practice. Mohamed et al. found that the use of the health belief model and empowering the subjects placed the onus on the patient.

A study of 21 African-American Type 2 diabetics residing on the South Side of Chicago used a combination of shared decision making, empowerment and culturally tailored diabetes education. The education was modified to fit the cultural and socioeconomic background of the study participants. At 3 and 6 months interval there were improvements in self- care behaviors, self-efficacy and a reduction in HbA1c from 8.24 at baseline to 7.33 at the time of the 3 month follow-up (Peek et al., 2012). Cultural discordance and physician bias were identified as affecting physician behaviors toward their African American patients. These factors negatively affected the practice of shared-decision making. Cultural understanding is an important component in patient education, empowerment and decision making. A lack of understanding of the impact that health beliefs, and cultural practices have on individual health care can influence receptiveness by the target population. Successful studies did not rely on stereotyping or assumptions, it used the knowledge cultural practices, and health beliefs to deliver effective patient-centered care.

In a study of 164 African American and Hispanic diabetics in Detroit community health workers was used as a part of a multidisciplinary team approach to diabetes management (Spencer et al., 2011). The participants engaged the use of the empowerment approach to provide self-management education over a six month period.

The workers were reflective of the culture served and proved effective in improving the mean HbA1c of study participants from a baseline of 8.6% to 7.8%. Improvement was also demonstrated in an understanding of diabetes (Spencer et al., 2011).

Long et al. (2012) undertook a two-phase mixed method study of the health beliefs of four Hispanic groups in the United States. Columbians, Guatemalans, Mexicans, and Puerto Ricans were included in the study, which sought to determine the common beliefs and differences of these groups. In the group Columbians and Puerto Ricans identified themselves as having good health, this was not so for the Mexicans and Guatemalans. Long et al. believed that this identification of health status was one reason for the latter groups being more likely to seek the care of health care providers for treatment. All four groups displayed similarities in their tendencies to obtain health care from informal sources and were more comfortable and trusting of providers who spoke their language (Long et al., 2012). There were similar beliefs shared by the subgroups however there were also distinct differences that in providing tailored education that was taken into consideration to ensure efficacy.

The theme that emerges throughout the studies is that customized diabetic treatment for individual ethnic groups results in improved self-management and biometric measurements.

General Literature

Tang, Funnel, and Anderson (2006) discussed strategies for accomplishing group diabetes self-management education. Advantages of group education are the fostering of interactions, educational activities and increased learning through the sharing of ideas.

This method is more cost efficient than individual one-on-one therapy. Overall participation in a group resulted in slightly greater reduction in HbA1c levels versus individual sessions. Johnson, Murray, and Huang (2010) explored the relationship between diabetes self-management education and the reception of care. Individuals who had received education were found to have a 2.5 times increase in the odds of receiving a higher level of care compared to those who had not received education. This higher level of care included annual foot exam, annual dilated eye exam, twice yearly HbA1c evaluation and the pneumonia and influenza vaccine.

Tan, Magarey, Chee, Lee, and Tan (2011) performed a study on the effectiveness of structured diabetes education on 164 individuals with poorly controlled diabetes. There was improved diabetic understanding and glycemic control at the end of the 12 week period. Advantages of structured approach are distinct theoretical approach and the incorporation of patient-educator interaction. In a study of 623 subjects from Minnesota and New Mexico diagnosed with Type 2 diabetes and HbA1c of greater than or equal to 7% were randomly placed into three intervention groups. The groups consisted of group education, individual educational intervention and usual care. In this study the most significant decrease in HbA1c was in the group that received individual education (-0.51%), compared to group (-0.27%) and usual care (0.24%). The authors found that individual education produced improved health behavior outcomes (Sperl-Hillen et al., 2011).

The benefit of a one-time structured diabetes self-management program was provided to 824 participants (Khunti et al., 2012). A 3 year follow up was conducted on

those persons who were deemed eligible. This study revealed that as it related to HbA1c there was insignificant long term benefit to the structured program versus persons who received usual care (Khunti et al., 2012). It bears noting that education should be ongoing in order for the sustainment of benefits. A randomized controlled trial was undertaken to assess the value of reinforcing the diabetes education of persons who had received prior education (Beverly et al., 2013). Persons in the intervention group had a modest improvement in HbA1c at three months but this improvement was not maintained for the duration of the study. What can be inferred from this and the previous study is that diabetes self-management needs to be ongoing to in order to sustain the benefits of glycemic control.

Chen et al. (2011) instituted a multidisciplinary team approach to treating the elderly Type 2 diabetic in a rural Taiwanese village. The community based approach utilized culturally proficient materials. The program which included counseling and evaluation lasted for a year. The study produced significant physiological and foot self-care improvement. While there was no decrease in HbA1c among the targeted population those persons with an increased risk for diabetic foot complication through referrals and angioplasty interventions achieved improved quality of life (Chen et al., 2011).

Conceptual Models, Theoretical Frameworks

Leininger's theory of culture care diversity and universality or transcultural nursing focuses on learning holistic and comprehensive culture care. The theory's purpose is the discovery of diversities in human care and universalities or commonalities in relation to worldview, social structure and cultural dimensions. These are then used to

identify methods of providing culturally fitting care to persons of similar or different cultures (Tomey & Alligood, 2006). Transcultural nursing is not limited to an awareness of patient cultures but involves the understanding of said cultures and the knowledge that this is fundamental to achieving efficacy. Care provided to the patient takes into account the patient's values, beliefs, behavior and expressions.

The major concepts of Leininger's theory are: human beings, worldview, social structure, and environment (George, 2002). Human beings are caring and able to provide care as it relates to various settings, cultures, and needs. In some cultures family and institutions are the dominant forces. The central purpose is to provide care to the individual, family, group, communities, societies, and institution Health is a "state of well-being or restorative state that is culturally constituted, defined, valued, and practiced by individuals or groups that enable them to function in their daily life" (Tomey & Alligood, 2006, p. 479). Culturally competent nurses have to be knowledgeable about the culture in which they practice. No one person can become the subject matter expert on the attributes of all cultures. It is therefore of utmost importance that a cultural assessment model is used to assist with the provision of education and other aspects of health care. All health care professionals should endeavor to strive for specific knowledge that focuses on attitudes, knowledge and skills used to implement culturally competent care (Douglas et al., 2014).Worldview is defined by Leininger as how a person or groups views the world as it relates to stance, value or perspective about life and the world. Social structure is the interconnection of spirituality or religion, relationship, economics, education, philosophy, language and cultural values. Environment includes

the physical, sociocultural and geographic. In an environmental context it includes the situation and experiences that shape and provides meaning in guiding decisions and expressions (Tomey & Alligood, 2006).

Health belief model (HBM) addresses the reasoning behind individual's failure to adopt and perform preventative health measures (Orji, Vassileva, & Mandryk, 2012). It provides insight into the explanation and prediction of health behavior and assists in an awareness of which beliefs should be targeted to impact positive health behaviors. HBM includes individual perception of their behavior, susceptibility and severity of disease, modifying factors (knowledge, socioeconomic factors and perceived threat of disease) and the likelihood that action will be taken to change behavior. The model states that self-care and care seeking behaviors are directed by individuals belief as to cause of disease, what is their model for care seeking, control and if the individual demonstrates an active or passive behavior (Hjelm, Berntorp, & Apelqvist, 2011). Diabetic patients, who perceive that they are at less risk of succumbing to complications than other diabetics, are less likely to engage in behavior modification that demonstrates a high level of active self-care (See Figure 1).

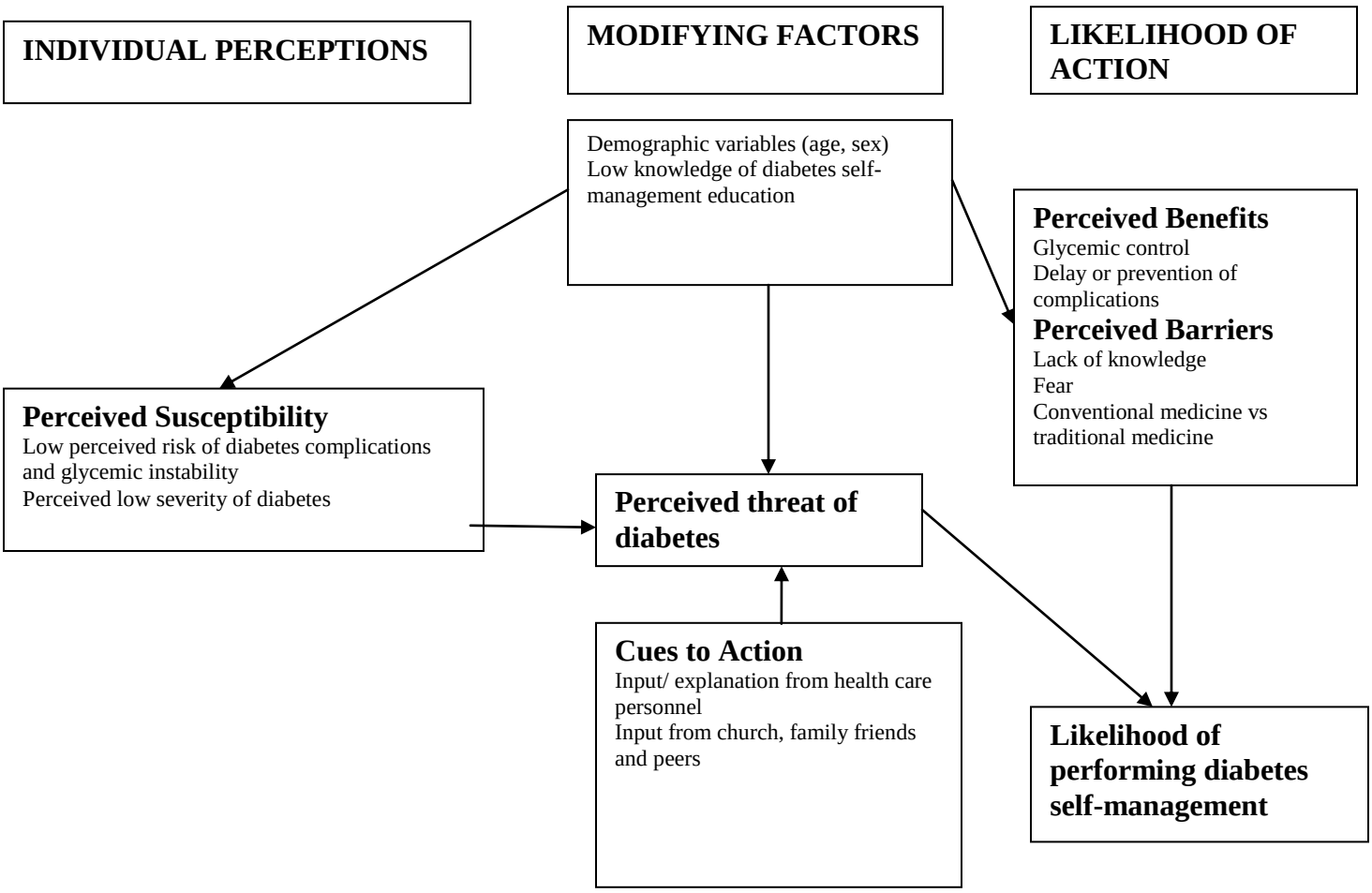


Figure 1 Health Belief Model: For Diabetes Self-Management Education

Section 3: Approach

Project Design/Methods

The project involved the use of culturally tailored diabetes education to educate staff treating diabetic English-speaking Caribbean patients. Using the criteria from the National Standards for Diabetes Self Management the provision of education related to disease process, nutrition, physical activity, pharmacological counseling, blood glucose monitoring, acute and chronic complications, alternative treatment, physical activity, risk prevention, spiritual and coping mechanisms was developed. Educational techniques included a diabetes education DVD, printed educational materials and a PowerPoint presentation of diabetes education for English-speaking Caribbean diabetic patients. Medical personnel received education using a diabetes curriculum which included diet, cultural and health beliefs of the targeted population. Knowledge areas included those covered in the National Standards for Diabetes Self-Management and include self-monitoring of glucose, hypo and hypoglycemia, physical activity, self-management problem solving, portion control, carbohydrate counting, meal planning, and oral diabetes medication. A Gantt chart with time lines for implementing all activities to support meeting the program's objective was developed (See Figure 2)**.**

Task	Start	End	Days	14-Aug	14-Sep	14-Oct	14-Nov	14-Dec	15-Jan	15-Feb	15-Mar	15-Apr
Program design	4-Aug-14	17-Aug-14	13									
Screening survey	18-Aug-14	25-Aug-14	7									
Indepth survey	26-Aug-14	14-Sep-14	25									
Needs identification	15-Sep-14	20-Sep-14	5									
Program design	1-Oct-14	1-Dec-14	61									
Education program	23-Mar-15	27-Mar-15	5									
Survey collection	30-Mar-15	31-Mar-15	2									
Process evaluation	1-Apr-15	5-Apr-15	5									
Findings presentation	6-Apr-15	10-Apr-15	5									
Program revision	13-Apr-15	24-Apr-15	11									

Figure 2 Gantt Chart for Diabetes Education

Population and Sampling

Institutional Review Board approval was obtained from Walden University; IRB record number 02-27-15-0391196. Medical personnel of the practice were recipients of the program. The intent was that they would attain knowledge and confidence in educating the targeted patient population; English-speaking diabetic patients of Caribbean descent in an internal medicine practice. Medical personnel received culturally tailored diabetic education which they would in turn reinforce to the patients.

Data Collection

A review of the practice's policy revealed that the practice does not have any written policy concerning diabetes education. This may have accounted for the inconsistency in the delivery of diabetes education, self-blood glucose monitoring and documentation of patient knowledge. Having an evidence-based diabetes program based on the national standards of diabetes self-management will improve patient outcome and improved self-management.

Data analysis

Observations of patient and staff interaction revealed that the practice would benefit from the education program. Discussions with the staff and physicians validated this finding.

Project Evaluation Plan

Process evaluation describes monitors and documents factors in order to improve the program's effectiveness and provide explanation of why or why not goals and objectives were met or not met (Hodges & Videto, 2011). The impact of the interventions on the outcomes was analyzed to determine if the desired outcome was achieved (See Figure 3).

Process evaluation of diabetes education provided to health care providers included fidelity, dose, reach, recruitment and context.

1. Fidelity: Was the diabetes education provided to the medical personnel implemented as planned?

2. Dose: How much education was provided? Did interaction, engagement and receptiveness occur on the part of the participants (medical personnel)? How satisfied were the recipients with the program?

3. Reach: The number of medical personnel who participated in the education program.

4. Recruitment: How were participants recruited?

The goal of providing culturally relevant diabetes education was attained and the objectives were achieved.

Objectives:

- Evaluate the internal medicine practice's current diabetes education program and develop quality improvement initiatives

- Develop an education program that improves medical personnel understanding of diabetes, diabetes control, and self-management

- Improvement of staff's diabetes knowledge and support to diabetic patients

- Development of integrated approaches to diabetes management

- Promotion and adaptation of health care policies that improve the care of diabetic patients

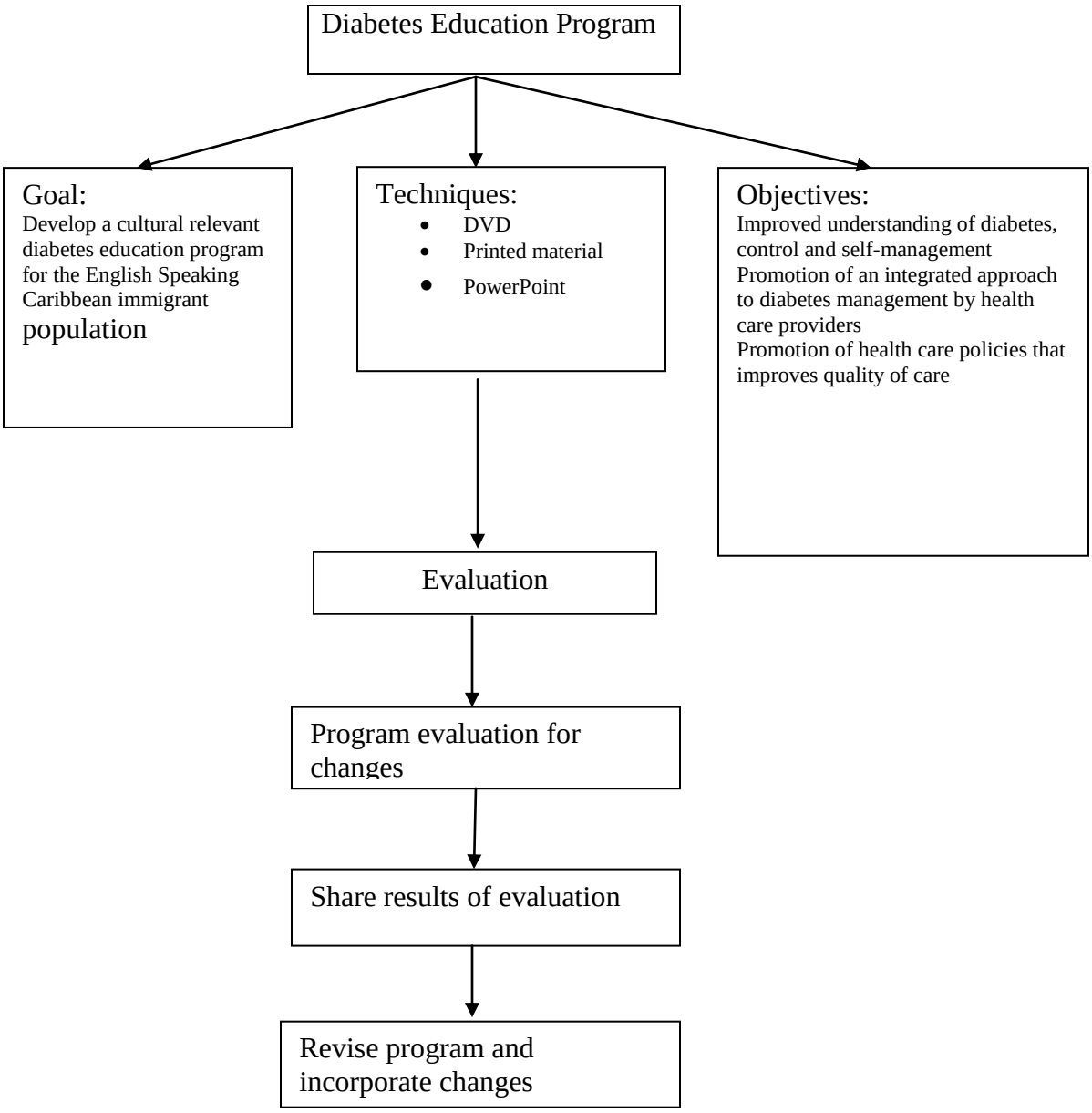


Figure 3 Diabetes Education Program.

Summary

There is an estimated 347 million persons afflicted with diabetes worldwide. Projection is that by 2030 diabetes will be the seventh leading cause of death (WHO, 2013). In 2012, 9.3% or 29.1 million Americans were reported as having diabetes. There is disparity in the care received by minorities in the United States and research on culturally tailored education for persons from the English-speaking Caribbean is lacking.

Diabetes care is multifactorial and complex and in order to be effective life-long support and learning is necessary. Diabetes self-management is an integral component of care and requires that patients take an active role in their care. A better understanding of spiritual/religious, use of folk medicine, food used to treat the disease, and health beliefs is needed in order to provide care that meets the need of the population. An education program that incorporates the traditions and culture of this population was developed, and provided to the staff of the internal medicine practice.

The goal of the project was the provision of a culturally sensitive tailored diabetes education program for medical personnel caring for English-speaking Caribbean diabetic patients.

Section 4: Discussion and Implications

Summary and Evaluation of Findings

In excess of 90% of diabetic patients are cared for by their primary care physicians and it has been estimated that 50-80% of diabetics have limited diabetic knowledge and skills (Celeste-Harris & Maryniuk, 2006). Few researchers investigated the differences in health and nutrition patterns of persons of Afro Caribbean descent (Davis & Huffman, 2006).

Evaluation of the internal medicines diabetes education program was undertaken. Deficiencies identified were inconsistent, "one size fit all" education that was not tailored for persons of different cultural and ethnic background. A major area of concern identified by medical personnel was difficulty in addressing the dietary needs of patients from the English-speaking Caribbean. Meetings were held with the physicians and medical personnel of the practice to garner their input in how to address their educational needs.

The project's purpose was to improve medical personnel knowledge of diabetes, the culture of English-speaking immigrants and patient diabetes self-management through the use of culturally relevant diabetic education. The goal of structured diabetes education was to assist medical personnel with knowledge and skills required for glycemic monitoring, medication adherence, dietary adherence and physical activities. Once medical personnel became recipients of the education the intent was the adoption of the curriculum for use in the education, and treatment of diabetic patients from the English-speaking Caribbean. Caribbean immigrants and persons of Caribbean descent

possess different health perceptions, behaviors, beliefs, and dietary habits from United States born patients. Cultural components that were unique to the target population were integrated into the diabetes education program targeted to ethnically-diverse patient population.

In developing the program every effort was made to ensure that the content was easily understood and could be reproduced for patient education.

In addition to oral hypoglycemic medication, physical activity and capillary glucose monitoring the use of alternative medication and foods consumed by English-speaking Caribbean nationals were presented to fulfill the objective of developing a culturally tailored diabetes program for medical personnel (See Appendices A-E).

Culturally sensitive diabetes education presented the use of alternative medicine (see Appendix B); periwinkle (Catharantus species), rice bitters (Andrographics paniculata), caraaili (Momordica charantia), aloes (Aloe vera), olive bush (Bonita daphnoides) and seed-under the leaf (Phyllanthus urinaria) used by persons of Caribbean descent in the treatment of diabetes. Teas made from the first two plants interfered with the control of diabetes (Lans, 2006). It was noted that the evidence for the use of herbal supplements to help control diabetes or it's complications was not strong and have not been proven effective (National Center for Complimentary and Integrative Health [NCCIH], 2013). The use of cinnamon in the treatment of diabetes has gained interest in the Caribbean and Caribbean immigrants. The use of cinnamon in the treatment of diabetes is not supported by review of 10 randomized controlled trials. Samples of cassia cinnamon were found to contain coumarin a substance that can cause or worsen liver

disease. Coumarin interacts with anticoagulants and can increase risk of bleeding (NCCIH, 2013). The use of cinnamon has been shown to decrease fasting blood glucose but not have a significant effect on HbA1c (Allen, Schwartzman, Baker, Coleman, & Pbung, 2013, p. 1). NCCIH (2013) noted that some dietary supplements may interfere/interact with traditional diabetes treatment, increase risk of kidney problems and have side effects.

The medical personnel at the practice were unfamiliar with the Caribbean food groups. Educating the target population historically had not included the foods consumed by the target population. References had been made to foods that were not the mainstay of their diet. Caribbean food groups include staples, vegetables, foods from animals, fats and oils, legumes and fruits. Staples include cereals, starchy fruits, roots and tubers, bread, porridge, yam, potato and rice. Foods from animals include beef, poultry, seafood, milk, and cheese. Legumes and nuts include peas and beans (Ministry of Education, Jamaica, 2009). Dietary information provided included how to count dietary carbohydrates, Caribbean food groups (See Appendix C), examples of ethnic foods, their caloric value, potion size, and a sample menu (See Appendix D). These were created with the intent that they can be reproduced and provided to patients.

Chronic illnesses can pose risk to psychological wellbeing. Diabetes is influenced by psychosocial factors and these can obstruct patients' abilities to manage the disease and succeed in attaining metabolic control (Kent et al., 2010). Spirituality and religion are useful in predicting the clinical outcome in persons suffering from chronic illnesses (Collins-McNeil, McCabe, Sharp, Hawkins, & Edwards, 2015). In order to address the

spiritual needs of patients' medical personnel, whether they themselves believer or not, must be educated and given resources (Collins-McNeil, et al., 2015).

While not every patient believes in and engages in spiritual and religious practices, there are those patients for whom this belief and practice are central to their beliefs. Religion and spirituality are coping resources used by individuals. They provide hope, offers an explanation that can assist the individual to make sense of their illness, and thus increase their ability to cope. Persons may defer control and responsibility to God and thus seek help through prayer and meditation in order to achieve diabetes control.

Once approval was received the project was implemented. Meetings were held with 16 members of the staff elected by the physicians, and the diabetes education program was introduced. The curriculum (see Appendix A) was provided to the personnel and guidelines on how to complete the self-paced diabetes education. The staff was provided with the PowerPoint and DVD material. The author of the project was present to answer questions, provide clarification and to garner feedback.

Over the courses of 3 weeks 100% medical personnel were introduced to the program with a total participation of 16 persons, two males and fourteen females. Adjustments had to be made which involved two personnel being away on maternity leave when the project was implemented. These persons had been involved in the project form the inception. The physicians requested that they also be introduced to the project. These staff members were provided with the DVD and PowerPoint presentation. I was available via telephone to provide clarification and answer questions if needed. Aside

from this adjustment introduction of the self-learning program transpired as anticipated. In implementing any project flexibility is an important component of facilitating successful quality improvement initiative.

One way of determining the effectiveness of the education program was to listen to participants comments and the use of questions and answer sessions. Some comments were, “This makes sense”, “This was easy to understand”, and “I’ll be able to explain this to the patients.” For all participants information that was provided concerning ethnic foods and caloric content was new information. All persons verbalized that they felt better equipped to meet the needs of diabetic patients from the English-speaking Caribbean. Personnel indicated that they would incorporate the education received into their practices.

Implications

Policy

Completion of a culturally tailored diabetes education program should be a requirement for all medial staff. When new medical personnel are hired they should also be recipients of this training. In order to provide superior patient care the practice must incorporate tailored diabetes program for patients from other cultural and ethnic background as well as American born patients. This curriculum could then be used as a guide for patient education, ensure that quality indicators are achieved, assess patient understanding, and address patient concerns.

Self-study is a flexible approach and it relies on an individual’s ability to learn on his/her own. The flexibility that this method provides allows for education that is not only

self-paced but allows for future access to the material. Repetition and frequent referencing the material defines repetitive learning. This builds a sense of competency, increases efficiency in personnel diabetes knowledge and impartation of patient education. The ability to provide successive patient education increases patient self-control and problem solving skills. Implementation of the education program demonstrated improvement of staff's diabetes knowledge and cultural sensitivity. This created education champions who have been provided with the tools to foster the development of integrated approaches to diabetes management. Additionally the education facilitated the promotion, and adaptation of health care polices that will result in improved care of diabetic patients.

Practice

Medical personnel who work in primary care; the forefront of providing diabetes care have a critical role in educating patients on diabetes self-management, and self care. Patient education places increased demands on the time and resources of the physicians when they are the sole educators. Educating the staff of the internal medicine practice fosters a team approach to caring for patients. This requires a rethinking of the roles of physicians and other staff members. Education will no longer be viewed as the sole responsibility of the physicians and not be limited to the patient-physician interaction.

Patient education can be undertaken on a one-on-one basis and in groups. The DVD can be played in the waiting room and education continued in the patient room. This allows for reinforcement of the teaching covered on the DVD. Using the DVD as a means of beginning the education process and adhering to the diabetes curriculum can be

utilized to promote group education. These tools can be used to initiate discussion among patients and to form support networks.

Research

Diabetes education and self-management are the foundation for diabetes treatment however there are few studies undertaken that addresses the nutritional preferences of persons form the Caribbean (Davis & Huffman, 2006). In order to be effective diabetes education must be understandable and relevant to the intended recipient(s). The effectiveness of a diabetes education program is undermined if an understanding of the target population is not achieved. Cultural and ethnic nuances; dietary, alternative therapy, religion and spirituality must be integrated into the curriculum. Culturally tailored diabetes education that incorporates dietary preferences, and cultural beliefs can enhance self-management. Lack of knowledge regarding the aforementioned components presents challenges for the development and implementation of a diabetes program. Medical personnel must consider important factors when developing a program and educating the population. These factors include demonstrating a respectful and caring attitude, supporting and understanding spiritual and cultural beliefs, effective communication and gaining trust (Whisenant, 2014).

Social Change

The focus of the project was to educate medical personnel serving a population for which culturally tailored education was lacking. Provide opportunity for increased access to diabetic education resources for both medical personnel, and patients. The establishment of structured diabetes education program which can be used by staff to

educate and empower underserved target population. Empower medical personnel through education; who will then serve as diabetic champions. Having diabetes champions and creating cultural sensitive education programs communicate to patients that staff place significance on what is to the patient. This can serve to increase patient engagement and participation in self-management.

An understanding by staff of how the environment impacts immigrant nutrition can serve to provide insight into means of improving diabetes self-management. Access to "fast food", prepared meals, increased portion size, eating ethnic foods in increased quantities while engaging in decreased levels of activity are factors that affect glycemic control. Current food portions exceed federal standards and education on portion size is warranted. An awareness of portion size will assist patients and medical personnel in adhering to dietary recommendations by positively impacting ability to monitor food intake. Education includes informing patients to replace larger dinnerware with smaller ones in an effort to reduce dietary consumption. Restaurants use large dinnerware and the general public is purchasing larger dinnerware for home use. The average size of dinner plates has increased approximately 23% since 1900 from 9.6 inches to 11.8 inches (Van Ittersum and Wansink, 2012). When these items are overly large there is the tendency to consistently place more food on larger dinnerware than ones that are smaller.

Nutrition education allows patients the ability to make educated decisions on food choices without denying them consumption of their ethnic food and foods of choice. An understanding of medications, exercise, and coping contributes to behavior changes that assists in the achievement of glycemic control and decreased complications. The diabetic

education program can be extended to include other primary care, internal medicine and endocrinology practices in the community who treat English-speaking Caribbean diabetics. Other sources of education dissemination are places of worship, hospitals and community centers. These venues provide outlets to reach larger patient population. The expectation is that increased patient education opportunities will foster successful behavior changes, and positively influence diabetes self-management.

Strengths and Limitations of the Project

This is one of the few studies done to provide an education program for personnel caring for the target population. The program was designed to convey important information in an easily understood manner. A limitation was that patients were not included into the project. Observation of medical personnel education and it's effect on diabetes self-management could not be observed. Despite this it is reasonable to assume that the education could be replicated in other medical practices and facilities. Future endeavors can be expanded to recruit and include patient participation from the target population.

Self Analysis

The process of the project development and evaluation has provided great insight into the importance of research and its invaluable contribution to project success. The knowledge obtained form research is conveyed to practice settings aimed at improving the health of the public (Natarajan, 2014). Researching involved the analysis of scholarly articles and consulting with other medical professionals. Incorporating research into the development and implementation of the diabetic education program required collaboration between the staff of the internal medicine practice and me. Transparency

was used during the each stage of the process in order to ensure success. Transparency and collaboration required the development of leadership skills. Skills that included effective communication required the use of active listening and allowed persons to impart their opinions without fear of reprisal. While the final decision was made by the author input from medical personnel was encouraged, and weighed in order to achieve program success.

The role of a practitioner was nurtured by fostering relationships with staff, observation of their relationship with patients. The pursuant of a means of enhancing the provider-patient relationship by using the Health Belief Model and Leininger's Theory of Culture Care Diversity and Universality or Transcultural Nursing to develop a diabetes education program served to cultivate my role as a practitioner. While the education was provided to medical personnel the end user (patients) had to be considered. Cultural competency and an understanding of it's impact on behavior as well as a knowledge of what motivates change in self-management were factors that steered the development and authoring of the project.

Scholarly writing is an important skill that one should develop and it is the tool for directing future nursing and health care practices. This form of writing while not as unfamiliar as it was at the inception of this program is still somewhat difficult. Proficiency in scholarly writing is achieved by continued engrossment in reading and analysing scholarly article and a commitment to authoring articles for publication. This tied into this author's long-term goal of expanding the project into developing a resource for used by medical personnel caring for English-speaking Caribbean diabetics.

Summary

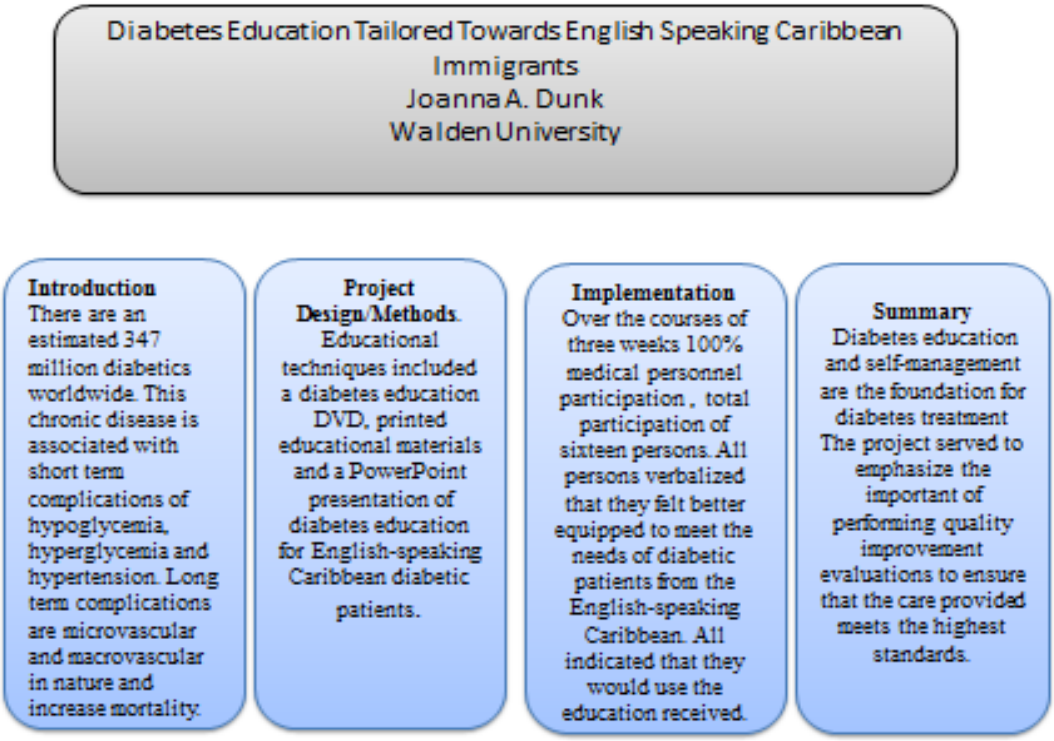
The project was undertaken to determine the educational needs of an internal medicine practice. An evaluation of the practice was obtained by casual observation of the medical staff and speaking with preceptor, and staff. The findings of the evaluation revealed that diabetes education was inconsistent and not tailored to the patient population. This led to the second aim of the project; develop a culturally tailored diabetes education program for medical personnel in an internal medicine practice. The practice treated English-speaking Caribbean diabetic patients, and it was this target population which was the focus of the project. Scholarly research was used to develop a diabetic curriculum which onus was on ethnic diet, alternative medicine, activity, glucose monitoring and religion, and spirituality. The project's goals was accomplished by utilizing the Health Belief Model and Leininger's Theory of Culture Care Diversity and Universality or Transcultural Nursing for understanding the values, beliefs and behaviors of patient population.

The project required the dedication of numerous hours and resources; contacting medical professionals within and outside of the continental Unites States. A potential barrier was the lack of information regarding nutritional and caloric content of ethnic foods consumed in the Caribbean. Relevant literatures were out of print, and therefore the author had to rely on the expertise of Caribbean dieticians. As the project unfolded the magnitude and potential impact was made clear. Caribbean nationals and medical professionals requested that the project be expanded to include them. As the project

gained momentum more research was needed in an effort to gain a more concrete understanding of how to obtain and provide dietary information.

The education program was a result of in-depth research and endless communications. Because there is no available research on the development of diabetic education for the target population, there is no measure with which to compare this project. Despite this the project served to emphasize the important of performing quality improvement evaluations to ensure that the care provided meets the highest standards, and fulfills the needs of patients.

Section 5: Scholarly Product



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Appendix A: Diabetes Education Curriculum

Diabetes education of English-speaking Caribbean patients
Diabetes disease process
Complications
• Acute
• Chronic
Medication
Behavior changes
Medical nutrition therapy
• Calorie content
• Fat intake
• Carbohydrate counting
• Caribbean food group
• My Caribbean Plate
Alternative medicine
Dietary supplements
Physical activity
Blood glucose monitoring
Risk prevention
• Smoking cessation
• Vaccination
• Foot exam
• Eye exam
• Dental exam
Spirituality/Coping mechanism

Diabetes Education

Type 1 diabetes
- Destruction of Beta cells usually leads to insulin deficiency

Type 2 diabetes
- Body unable to make enough insulin to meet the needs of the body
- Insulin resistance: body cannot efficiently use the insulin made by the pancreas

Pancreas' role in glucose regulation

High Blood Sugar → Pancreatic response →

Low Blood Sugar → Pancreatic response →

Insulin secreted by Beta Cells ↓ Alpha Cells

Glucagon secreted by ↓

Glucose used by cells, muscle and liver ↓ liver

Glycogen released by the ↓

Blood sugar returns to normal

Blood sugar returns to normal

Complications: Acute

Hyperglycemia

- Frequent urination
- Thirst
- Hunger

May or may not include

- Headache, sleepiness, difficulty concentrating
- Visual disturbances
- Dry or flushed skin
- Fatigue
- Leg cramps

Hypoglycemia

- Tremors
- Sweating, pallor
- Dizziness, feeling faint
- Excessive hunger
- Mood swings, erratic behavior
- Confusion, sleepiness
- Visual disturbance
- Elevate heart and respiratory rates
- Slurred speech
- Seizure and coma

Treatment for hypoglycemia

- 2-3 sugar packets
- 4 oz. (1/2 cup) of 100% unsweetened fruit juice
- 4 oz. (1/2 cup) soda (not diet)
- 3-5 pieces of candy (not sugar-free)
- 4 teaspoons of sugar or honey

- 3-4 glucose tablets
- 1 packet of glucose gel

Complications: Chronic

Cardiovascular disease

- Atherosclerosis (plaque deposit in the arteries)

Coronary artery disease

- Plaque deposits narrow the coronary arteries, blocking the flow of oxygen rich blood to the heart muscle

Myocardial infarction (Heart attack)

- Severe blockage of coronaries arteries can lead to damage of the heart muscle

Cerebral vascular accident (Stroke)

- Blood flow to a portion of the brain is reduced or blocked. Brain tissue is deprived oxygen and nutrients, leading to death of brain cells

Neuropathy (Nerve damage)

- High blood glucose levels damage the walls of capillaries that provide nutrients to nerves which subsequently leads to nerve damage

Nephropathy (Kidney disease)

- Diabetes damages the filtering system of the kidney

Retinopathy (Eye damage)

- The vessels that provide nutrients to the retina are among the first vessels to be damaged by high glucose levels

Medicines: Oral

Sulfonylureas

- Glimeripide (Amaryl), Glipizide (Glucotrol, Glucotrol X), Glyburide (DiaBeta, GLynase)
- Stimulate pancreas to release insulin
- May cause hypoglycemia

Biguanides

- Metformin (Fortamet, Glucophage, Glucophage XR, Riomet)
- Reduces the amount of glucose released by the liver
- Does not cause hypoglycemia
- May promote weight loss
- May reduce cholesterol and triglycerides
- Rare side effect: lactic acidosis
- Gastrointestinal disturbances (upset stomach, nausea, diarrhea)

Alpha-glucosidase inhibitors

- Acarbose (Precose), Miglitol (Glyset)
- Slows absorption of glucose into the bloodstream

- Limits the rapid rise of blood glucose that can occur with meals (must be taken with meals)

- May cause weight gain
- Causes abdominal bloating and diarrhea
- May cause liver damage at high doses

Thiazolidinediones (TZDs)

- Pioglitazone (Actos)
- Helps to reduce blood glucose by increasing cells sensitivity to insulin
- Takes a few weeks to demonstrate effect on blood glucose
- Taken with or without food
- Weight gain, edema, worsen heart failure due to fluid retention, increase risk of bladder cancer and bone fracture, and liver disease
- Lessens effect of birth control pills

Meglitidines

- Nateglinide (Starlix), Repaglinide (Prandin)
- Stimulates pancreas to release insulin when glucose levels raise after meals
- Works quickly
- Must be taken with meals
- Can cause hypoglycemia and stomach upset

Dipeptidly-peptidase 4 (DDP-4) inhibitors

- Alogliptin (Nesina), Linagliptin (Tradjenta), Sitagliptin (Januvia), Saxagliptin (Onglyza)
- Stimulates pancreas to release insulin
- Does not cause weight gain or hypoglycemia
- May cause upper respiratory tract infection, runny nose, sore throat, nasal congestion or headache
- Increase risk of pancreatitis

Behavior Changes
Medical Nutrition Therapy

Calorie Content

- Kilocalorie or calorie: measure of food energy
- Fat: 9 calories per gram
- Carbohydrate: 4 calories per gram
- Protein: 4 calories per gram
- Alcohol: 7 calories per gram

Fat

- Provides 9 calories per gram
- Limit to 25%-35% of daily caloric intake
- 10%-15% from monounsaturated fats (canola oil, olive oil, nuts and avocado)
- Only 7% from saturated fat (animal products and hydrogenated and partially hydrogenated oils)
- Choose fats from polyunsaturated sources (vegetable oil and fish oil)
- Limit cholesterol to less than 200 mg per day

- Saturated and trans-fat contribute to cholesterol and triglycerides in the body
- Limit trans fatty acid

Carbohydrate

- Provides 4 calories per gram
- Recommend minimum requirement 130 grams per day
- Limit to 40%-45% of daily caloric intake
- 15 grams of carbohydrate = 1 carbohydrate serving/choice

Fiber

- A form of carbohydrate from plant origin
- Has no caloric value
- Recommended intake 14 grams per 1000 calories eaten (approximately 25 grams per day)

Protein

- Provides 4 calories per gram
- Recommended daily allowance 0.8 grams per kilogram of body weight
- Limit to 10%-35% of total daily caloric intake

Carbohydrate food Group

(See Appendix C-D)

My Caribbean Plate

(See Appendix E)

Alternative Medicine

Herbs used in the Caribbean for the treatment of diabetes. Efficacy has not be substantiated by research

- Periwinkle (Catharantus species)
- Caraaili (Momordica chatantia)
- Olive bush (Bonita daphnoids)
- Rice bitters (Andrographics paniculata
- Aloe (Aloe vera)
- Seed-under-the-bush (phyllanthus urinaria)

Dietary Supplements

Chromium

- mixed results in research

Cinnamon

- Helps to lower blood glucose.

- Monitor blood glucose for hypoglycemia

Magnesium

- Increases insulin sensitivity
- Poor metabolic control can lead to magnesium deficiency
- Daily value 400mg

Physical Activity

Exercise

- Reduces insulin resistance
- Increases glycemic control
- Glucose uptake from blood continues for approximately 24 hours after exercising
- Greater risk for hypoglycemia during the 24 hours post exercise
- Monitor for signs of hypoglycemia and treat accordingly

Aerobic activity

- 150 minutes weekly
- 30 minutes at least 5 days per week

Strengthening exercises

Stretching or flexibility exercises

Blood Glucose Monitoring

Goals for blood sugar control

- Fasting 70-99 mg/dl
- Before meals and at bedtime 70-130 mg/dl
- Peak: 1-2 hours after meal began < 180 mg/dl
- Hemoglobin A1c <7.0%

(ADA, 2011)

Monitor and record blood glucose level before meals and at bedtime to help determine if treatment is working.

Monitoring may include post meal blood glucose if warranted.

Risk Prevention

Smoking cessation

- Increase macrovascular risk
- Increase risk of diabetic retinopathy
- Detailed history: amount smoke and efforts to stop
- Smoking cessation medications or patches
- Referral to smoking cessation program

Vaccination

- Influenza
- Tdap
- Pneumococcal
- Hepatitis B

- Zoster for persons age 60 years or older
- MMR if born in or after 1957 and have not received the vaccine
- Varicella if born in or after 1980 and not received two doses or immunity to Varicella

(CDC, 2014)

Foot exam
Check daily for:

- Blisters, cuts and bruises
- Cracking, peeling, and callouses
- Redness, red streaks, and swelling

Wear well fitting shoes
Do not go barefoot
Wear seamless socks to prevent friction
Do not use foot soaking products
Podiatry referral
Eye exam annual
Dental exam biannually

Spirituality

Belief in healing
Reliance on God to control the disease
Non acceptance of diagnosis because acceptance demonstrate doubt in God's power

Coping

Support system: family, friends , fellow diabetics, place of worship
Problem solving: clearly communicate and listen to the problem, assist in finding a solution, and then agree on the solution

Summary

Diabetes education is an important component of diabetes treatment.
Effective communication is key to obtaining the best outcome.
Patient is the central figure.
Patients ultimately make the decision concerning adherence to diabetes self-management.
Decisions are collaborations between the patient and the health care team.

Appendix B: Herbs used in the Caribbean for the treatment of diabetes

(Their efficacy in the treatment of diabetes is not support by evidence)

Periwinkle (Catharantus species)
Caraaili (Momordica chatantia)
Olive bush (Bonita daphnoids)
Rice bitters (Andrographics paniculata
Aloe (Aloe vera)
Seed-under-the-bush (phyllanthus urinaria)

Appendix C: Caribbean Food Group

Food Portion and Substitute List

List 1: Staple Foods

A. Bread, Rice and Cereal Substitute

Portions to give approximately 70 calories, 15 grams carbohydrates, 2 grams protein

Bread/toast shop, sliced	1 slice 10cmx10 cm (4"x4")
Bread, hard dough	1 thin slice
"Hops" bread	½ large
Bammy	½ small (6" diameter, 11/2" thick)
Biscuits, small, round water type	6 only 3 cm (11/4"dia)
Biscuits, cream cracker type	3 only 5 cm (2" diameter or square)
Roti	¼ (9" diameter) made from 1 cup of flour
Bake/Johnny Cake (baked)	¼ made from 1 cup of flour
Rice and peas, cooked	½ cup
Cornmeal porridge, medium consistency	½ cup (cooked with water)
Arrowroot, medium consistency	½ cup (cooked with water)
Flour (dry, uncooked): wheat/plantain/yam,	2 tbsp.
Dumpling made from 2 tbsp. flour/cornmeal	1 only
Weetabix	1 only

B. Starchy Roots, Fruits and Tubers (ground provision)

Portions to give approximately 70 calories, 15 grams carbohydrates, 2 grams protein

Breadfruit	2 pieces (2”x1” wedge) or 2 oz.
Cassava	1 piece (2”x 11/2”) or 2 oz.
Dasheen	1 slice (2”x 2 1/2”x 1/2”) or 2 oz
Eddoe/Coco	1 medium or 2 oz
Green banana/green fig	1 medium
Irish Potato, baked or boiled	1 medium or 3 oz
Irish Potato, mashed	1/2 cup
Peewah	2 medium
Plantain (ripe)	2 medium
Sweet Potato	1 slice (2”x21/2”x1/2”)
Yam/Yampie	1 slice (2’x21/2’x1/2) or 2 oz

List 2: Legumes/Nuts

Portions to give approximately 73 calories, 14 grams carbohydrates, 14 grams protein

Channa/Chickpea	1/3 cup
Chataigne/breadnut	2-3 seeds
Dahl, medium consistency	½ cup
Dried peas and beans (1 tbsp. dry), cooked	1/3 cup
Green Pigeon/Gungo Peas/Broad Beans	1/3 cup
Stewed Peas	1/3 cup

List 3:

A. Dark Green Leafy, Yellow and Other Starchy Vegetables

Vegetables may be used as desired if consumed raw. When cooked consume only 1 cup. If fat, oil, or salad dressing is used in cooking or serving calculate as part of fat allowance. The vegetables listed may also be used at each meal in addition to other vegetable allowance.

Bhagi	Bamboo shoots
Cabbage	Callaloo, (Dasheen leaves, Amaranthus)
Carailli	Chives/green seasoning
Christophene/Chocho	Cress/Criches/Cressles
Kale	Melongene/Egg Plant/Aubergine/Baigan
Mustard greens	Okra
Pak Choy/Patchoi/Chinese Cabbage	Pawpaw, green
Squash (cucumber type)	Tomato

B. Yellow and Other StarchyVegetables

Portions to give approximately 36 calories, 7 grams carbohydrate, 2 grams protein

Beetroot	½ cup
Bodi	¾ cups
Carrot	½ cup
Chow Mein (Chinese vegetables)	½ cup
Onions	1 medium or 2 small or ½ cup

Pumpkin	½ cup
String beans, salad beans (immature pod)	¾ cup
Turnip	½ cup

List 4

Fruits

Portions to give approximately 40 calories, 10 grams carbohydrate

Portugal/Tangerine/Potigal	1 medium
Cashew, fruit	1 large
Cherries (West Indian)	20
Coconut water	¾ cup
Dunks/Jujube/Coolie Plum	12
Figs, ripe (small banana)	1 small
Figs, Silk (small)	1 only
Figs, Sucrier (small)	2
Guava	1 medium
Guineps/Ackee (not Jamaican) Chennette	10
Mammie Apple	½ cup
Mango, ripe	1 small
Pawpaw/Papaya	½ cup cubed or 1/3 medium
Pineapple	1 slice 1 cm-2cm (1/2'-3/4") thick

Plums	10 small or 6 medium
Pommcythere/Golden Apple/ June/ Jew Plum	1 medium – 8cm x 5cm (3’ x2”)
Pommergranate/Pronganat	1 small
Pommerac/Ohtaheite Apple	1 medium
Sapodilla/Naseberry	1 medium
Soursop, pulp	1/2-3/4 cup (120-180 ml)
Soursop, juice unsweetened	1/3 cup, 80 ml
Star Apple/Caimit	1 medium/small
Sugar Apple/Sweet Sop	1 small

List 5: Food From Animals

Portions to give approximately 73 calories,7 grams protein, 5 grams fat. Measure all meats after cooking. Legumes may be substituted for foods from animals.

A. Lean Meats

Portions provide approximately 55 calories, 7 grams protein, 3 grams fat.

1. Meats (very lean) and Poultry (with skin removed)

Chicken	1 drumstick
Chicken, sliced	2 slices (11/2”x 3”)
Chicken wing	1 small

Chicken necks	2 small
Liver	11/2” x 2” x ½”, small matchbox size
Kidney (stewed)	1 tbsp.
Rabbit, thin slices, game meat	4 small cubes, or 1 oz. cooked

2. Fish

Fresh Fish	1 small piece (21/2” x 2” x1/2”)
Flying Fish	1
Salted Fish	1 small piece (21/2” x 3”)
Shrimps, Prawns	5 medium
Oysters	3 medium

3. Cheese

Cottage cheese	2 tbsp.
Grated Parmesan	2 Tbsp.

3. Medium Fat

Portions provide approximately 75 calories, 7 grams protein, 5 grams fat

1. Meats and Poultry

Goat (boneless)	1 tbsp or 1 oz.

Beef (trimmed)	1 oz.
Pork chop	1 small

2. Fish (Canned and drained)

Tuna, salmon, mackerel	¼ cup
Sardines	1 large or 2 small

3. Eggs

Egg (whole)	1 medium

C. High Fat

Mutton or lamb (trimmed)	1 oz. or 4 small cubes
Pork	1 oz.
Minced meat	2 tbsp.
Sausages	1 small or ½ large
Oxtail	1 piece, 5 cm x1 cm (2’ x ½”)
Corned beef	¼ cup or 4 tbsp.

Cheese

Cheddar and American	2.5 cm, 1 cube (1 oz.)

D. Milk

Portions contain approximately 6 grams carbohydrate, 4 grams protein

1. Skim and very low-fat milk

Portion provides approximately 6 grams carbohydrate, 4 grams protein, 40 calories

Milk, liquid skim	120 ml, ½ cup
Milk, powdered	21/2 tbsp.
Yogurt (plain low fat)	4 oz.

2. Low Fat Milk

Portions provide approximately 6 grams carbohydrate, 4 grams protein, 2 grams fat, 58 calories

2% Milk	½ cup
Yogurt with 2% milk	4 oz.

3. Whole Milk

Portions provide 6 grams carbohydrate, 4 grams protein, 4 grams fats, 76 calories. Limit use

Milk, fresh cow's	120 ml , ½ cup
Milk evaporated (whole before adding liquid)	60 ml, ½ cup
Milk, powdered whole	2 tbsp.

Yogurt, plain	4 oz

List 6: Fats and Substitutes

Portions provide approximately 45 calories, 5 grams fat

A. Unsaturated Fats

Margerine, oil (corn, soybean etc.)	1 tsp.
Avocado	10 cm , 1/8 (4” diameter)
Ackee (Jamaica)	3 pieces
Peanuts	10 only
Salad dressing, mayonnaise type	1 tsp
Salad dressing (all varieties)	1 tbsp
Salad dressing (reduced calorie)	2 tbsp

B. Saturate Fats

Butter	1 tsp
Ghee	1 tsp
Bacon	Small rasher
Salt pork	2.5 cm, 1” cube
Coconut (dried, grated)	2 tbsp
Oil (Coconut and palm)	1 tsp.

(The Caribbean Food and Nutrition Institute, 1994)

Appendix D: Sample meal plan and menu

1800 calorie diet

Staples	11 servings
Legumes	2 servings
Dark green leafy vegetable	As desired
Yellow vegetable	2 servings
Fruits	3 servings
Food from animals (includes milk products)	8 servings
Fats	3 servings

2000 calorie diet

Staples	11 servings
Legumes	2 servings
Dark green leafy vegetable	As desired
Yellow vegetable	2 servings
Fruits	3 servings
Food from animals (includes milk products)	9 servings
Fats	3 servings

1800 Calorie Sample Menu

Sample Meal Plan	Food Portions	Sample Menu
Morning Meal		Morning Meal
Egg or substitute	1 serving	2 sardines
Dark leafy vegetables	As desired/liberal	Callaloo
Bread or substitute	4 servings	1 cup of cornmeal porridge or 2 slices of bread
Butter or other fat	1 tsp	1 tsp butter
Milk (low fat)	½ cup liquid, or 2 tbsp. powdered or 1/4 cup evaporated	½ cup milk/coffee
Mid-Morning Snack		Mid-Morning Snack
Fruit	1 serving	Pawpaw ½ cup cubed or 1/3 medium
Noon Meal		Noon Meal
Meat or substitute	2 servings	2 oz. of beef stew (8 cubes)
Oil (cooking)	1 tsp.	1 tsp. of cooking oil for beef
Staple (ground provision)	2 servings	Cassava 1 piece (2”x 11/2”) or 2 oz.
Green leafy vegetable	As desired/liberal	Chives/green seasoning, chopped cabbage, sweet

		pepper with vinegar dressing
Yellow or other vegetable	1 serving	½ cup of pumpkin
Legumes	2 servings	Pigeon peas 1/3 cup
Fruit	1 serving	Guava juice, unsweetened, ½ cup
Mid-Afternoon Snack		Mid-Afternoon Snack
Milk (low fat)	2 tbsp. powdered or ½ cup liquid	1/2 cup milk
Bread or substitute	1 serving	3 small cream crackers
Evening Meal		Evening Meal
Meat or substitute	2 servings	2 oz. of baked fish
Bread or substitute	2 servings	1 roll or 1 slice (2'x21/2'x1/2) or 2 oz of Yam/Yampie
Fat	1 tsp.	1 tsp. of oil
Green leafy vegetable	As desired/liberal	Lettuce or tomato salad
Yellow or other vegetable	2 servings	¾ cup of string beans + ½ cup carrots
Fruit	1 serving	¾ cup coconut water
Bedtime snack		Bedtime snack
Bread or substitute	1 serving	6 small biscuit (water type)
Milk (low fat)	½ cup liquid,	½ cup of milk

Appendix E: Example of Caribbean meal planning table setting