Factors Influencing Self Care Behaviors of African Americans Adults with Type 2 Diabetes

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Abstract

Purpose
The purpose of this study is to review research publications on factors that influence self-care behaviors of African American adults with T2DM. The subsequent goal is to make recommendations to clinicians who will help African Americans to improve their diabetes self-management.

Methods
A review of current literature was conducted using the National Library of Medicine - PubMed, CINAHL, Cochrane Library and the Google scholar search engine. Each was consulted using the search terms self-care behaviors, self-efficacy, self-management, education, African American, coping styles, management, type 2 diabetes mellitus. The studies chosen for this paper were those in which the study population contained at least 15% of African Americans and directly addressed factors affecting self care behaviors.

Results
Eleven studies that investigated self-efficacy, social support, outcomes expectancy, health beliefs, education, quality of life, physical activity, diet, coping and well being in relation to self care behaviors were found.

Conclusions
In consideration of the fact that African Americans are twice as likely as non-Hispanic whites to develop diabetes and more likely to suffer complications from diabetes, finding ways to help them improve their diabetes self-care behaviors is critical to developing effective measures and interventions that may have long-term effects on both metabolic outcomes and quality of life.
Introduction

Type 2 diabetes (T2DM) is characterized by the body’s resistance to insulin and/or a relative inadequate production of insulin by the pancreas (American Diabetes Association [ADA], 2010). The World Health Organization (WHO) reports diabetes as a leading cause of morbidity and mortality worldwide (World Health Organization [WHO], 2011). Diabetes is a chronic disease leading to premature death and morbidity. The number of persons with diabetes tripled between 1980 and 2008 from 5.6 million to 18.1 million in the United States (US) (Centers for Disease Control and Prevention [CDC], 2010c). Also in 2008, the CDC estimated that almost eight percent of the total US population suffers from diabetes, diagnosed and undiagnosed. This represents 23.6 million people in the population. Approximately 90 - 95% of all people affected by diabetes have type 2 (CDC, 2011a).

In 2005, diabetes contributed to 233,619 deaths in the US. In 2006, it was ranked as the seventh leading cause of death in the US. When comparing men to women in the US, irrespective of ethnicities, one can see 11.2% versus 10.2% of the population aged 20 and older is affected by diabetes (CDC, 2010a).

African Americans are twice as likely as non-Hispanic whites of the same age to develop diabetes. In 2006 African Americans were 2.3 times as likely as non-Hispanic whites to die from diabetes (The Office of Minority Health [OMH], 2010a). The National Center for Health Statistics reports that diabetes was the fifth leading cause of death amongst African Americans in the US in 2006 (Heron, 2010). From 1980 – 2008, African Americans diagnosed with diabetes showed consistently higher proportions of the disease than whites and Asians in terms of age-adjusted percentages. The age-adjusted percentages by race for people with diabetes indicated that about five percent of whites, compared to almost nine percent of African Americans were
diagnosed with diabetes in 2008 (CDC, 2010b). These data show that African Americans continue to be one of the minority groups most affected by diabetes in terms of prevalence and poor outcomes consequently warranting continued investigation for improvement of outcomes.

In 2007, an estimated cost of $174 billion was attributed to diabetes in the United States. Of this amount, $116 billion was directly associated with medical costs. Taking into account adjustments for population age and sex differences, these medical costs are 2.3 times higher for persons diagnosed with diabetes than those not diagnosed. Approximately one third of the total costs are indirectly attributed to disability, work absenteeism and premature mortality (CDC, 2010a). The US census bureau projects an increase in life expectancy from 76 years in 1983 to 82.6 years in 2050 (U.S. Census Bureau, n.d.). Therefore, we can expect people to live with diabetes and its complications for many years. This in turn implies an increase in all aspects of costs of maintaining the disease.

Self-care management is a critical option for care, especially considering the growing cost of health care in the US, in general, the cost of diabetes care in particular, and the implications for disabilities from the long term effects of T2DM or uncontrolled T2DM (Jennings, Powell, Armstrong, Sturt, and Dale, 2009). Education and behavioral modification have been identified as effective self-care management strategies in diabetes care. As such, they have been recognized as the cornerstone for effective diabetes care for decades, leading to the establishment of national standards for diabetes self-management education (DSME) (Funnell et al., 2008). Research continues to show the effectiveness of self-management education in T2DM on various aspects of the disease in the short term; for example, glycemic control (Norris, Lau, Smith, Schmid, and Engelgau, 2002). However, T2DM is a chronic disease process. Therefore, it
is the behavioral modifications that do or do not develop from this education that are of paramount importance.

**Risk Factors and Complications of T2DM**

Several risk factors contribute to the development of T2DM. Risk factors include age, race, sex, obesity, physical inactivity and family history (Diabetes Prevention Program Research Group, 2000). The Diabetes Prevention Program (DPP) study showed individuals aged 60 and older are at high risk for T2DM. This research conducted on 3,234 participants demonstrated that adults, age 60 and greater, who are at high risk for developing T2DM, can prevent or delay the onset of T2DM using lifestyle interventions such as weight loss, diet, and exercise.

Type 2 diabetes can have a number of serious complications especially if it goes undiagnosed for many years. As the glucose in the body is unable to get into the cell for use, complications develop with the buildup of fats and glucose in the bloodstream (Fowler, 2008). One of the main complications of the buildup of glucose and fats in the bloodstream is a deterioration of the endothelial lining of arteries. Arteries can become sclerosed (hardened) with buildup as atherosclerosis develops. Arteries can also become sticky, leading to increased platelet adhesion, plaque buildup and consequent narrowing of the arteries. When these types of buildup occur in the coronary arteries, individuals run the risk of myocardial infarctions (heart attacks) and strokes (NDIC, 2005). When the same type of buildup leads to occlusion in the lower extremities this is called peripheral artery disease (PAD). About 12 million people are affected by PAD in the US. People with diabetes make up an underestimated 20% of that number, according to the Framingham Heart Study. Peripheral artery disease can progress to limb loss in about 4% of those affected by it (ADA, 2003). The CDC reports that greater than 60% of non-traumatic lower limb amputations occur in people with diabetes (CDC, 2010a). The
foregoing examples relate to the complications of diabetes on larger blood vessels (macrovascular disease).

Hypertension (high blood pressure) which results from blood flowing through vessels having a reduced diameter (lumen) is also a complication of diabetes (CDC, 2010a). Independent of multiple risk factors that may exist, T2DM serves as a strong risk factor for the development of ischemic disease, stroke and death (Fowler, 2008).

Type 2 diabetes can have an effect on smaller blood vessels (microvascular disease), as well. These effects can be seen over time in the kidneys, eyes, and nerves. In 2005, the U.S. Renal Data System reported that African Americans were nearly four times more likely than non-Hispanic whites to develop kidney failure which requires dialysis or kidney transplant (National Kidney Disease Education Program [NKDEP], 2005). Alterations to the filtering of impurities in the body occur as the arteries of the kidneys are affected. Large particle proteins are usually filtered by the kidneys so that proteins can remain in the body for subsequent use. With the renovascular vessels affected, proteins are not filtered well, if at all, and are allowed to be excreted into urine, damaging the kidneys. This results in kidney disease in people with diabetes and ultimately renal failure (National Kidney and Urologic Diseases Information Clearinghouse [NKUDIC], 2009). Diabetes accounts for almost half of the new cases of kidney failure (NKUDIC, 2008). According to the National Institute of Diabetes and Digestive Kidney Diseases (NIDDK), diabetes was the number one disease process leading to end stage renal disease in the U.S. in terms of prevalence and incidence in 2007 with 197,037 and 48,871 respective recordings (NKUDIC, 2010).

Blindness caused by diabetes is the most common cause of new cases of blindness in adults greater than age 20. The Wisconsin Epidemiologic Study of Diabetic Retinopathy
(WESDR) found 1.6% of people with T2DM are legally blind. (Fong et al., 2004) By the time people are diagnosed with diabetes, about 20% of those with T2DM already experience some retinopathy or will develop some form of it over time (Fong et al., 2004).

Type 2 diabetes can cause damage to the nerves, called diabetic neuropathy. Neuropathy is most commonly seen in the lower extremities. Neuropathy in the feet can lead to what is termed as the diabetic foot. Diabetic neuropathy, in addition to diseased arteries of the lower extremities, is responsible for toe, foot or leg amputations. Diabetes is the primary cause of amputations in the U.S. (Boyko et al., 1999). The age adjusted rate for lower extremity amputations per 1000 persons with diabetes was 5.0 among African Americans in 2006 as compared to 2.4 in whites (CDC, 2011b).

Though there are other complications from diabetes, African Americans experience higher rates of four of the complications previously discussed: blindness, amputations, kidney disease, and heart disease (Chlebowy and Garvin, 2006). Data from 2008 showed the total age adjusted percentage of African American adults per 100 persons with diabetes reporting visual impairment was 18.3% (OMH, 2010a). In comparison to the general population, African Americans with diabetes are 2.7 times as likely to suffer from lower extremity amputations. They are between three to six percent as likely to suffer from kidney disease. African American adults with diabetes have death rates of approximately two to four times greater than those without diabetes (ADA, n.d). Because African Americans experience higher rates of complications from diabetes in the areas of blindness, amputations, and end stage renal disease, and there is a burgeoning older population, it is important to find ways to make self management more effective, as successful outcomes in T2DM are grounded therein.
T2DM Self-Management

The foundation of successful outcomes in T2DM is effective self-care management (Mensing et al., 2002). People with T2DM must take charge of their day to day care in order to prevent or delay onset or complications. It is one’s personal behaviors (self-care) that influence day to day diabetes care and subsequent clinical and metabolic outcomes (Keyserling et al., 2003).

Factors Influencing Self-Care Behaviors

Although self-management training in T2DM has been studied and identified to be effective in the short term, it is important to identify pathways and barriers that are culturally sensitive. It is equally as important to identify how these cultural determinants affect self-care behaviors and to use that information to develop effective measures and interventions that have more long term effects.

In order to assume the necessary charge for their care, individuals must perceive themselves as capable of having some influence on the effects of their disease process and its outcomes. That perception defined as self-efficacy, has been studied in relationship to behavioral change (Bandura, 1977). The positive effects of self-efficacy enhancing strategies to change health behaviors have been reviewed in relation to the role of the nurse (Holloway and Watson, 2002). The more a person believes that their actions can have a positive impact on their disease process (outcome expectancy) the more likely they are to follow a prescribed regimen. They are even more apt to follow through with the regimen if they were instrumental in establishing it (Handley et al., 2006). One study found outcomes expectations to be significantly related to self-care behaviors in African Americans (Chlebowy and Garvin, 2006). This finding was consistent
with another study that had previously been done in African American women with T2DM (Skelly, Marshall, Haughey, Davis, and Dunford, 1995).

Indeed, a systemic review of randomized controlled trials conducted by Norris and colleagues (2001) demonstrated that self-management training in T2DM is effective, especially in the short term. Self-management training was defined as “the process of teaching individuals to manage their diabetes” (Norris et al., 2001, p. 561). However, training and education is most effective if it includes strategies for behavioral change in self care through a collaborative approach (Funnell and Anderson, 2004). Factors that have been studied and shown to influence diabetes self-management for African Americans include self-efficacy, outcomes expectations (Skelly et al., 1995), health beliefs (Aljasem, Peyrot, Wissow, and Rubin, 2001), knowledge (Hendricks and Hendricks, 2000), coping styles, well-being (Samuel-Hodge, Watkins, Rowell, and Hooten, 2008), social support and quality of life (Tang, Brown, Anderson, and Funnell, 2008). The importance of cultural values when looking at strategies and factors of influence are key components of helping people acquire effective self care management behaviors (Skelly et al., 2000).

Research has shown positive behavioral changes in the short term via self-management training in people with T2DM (Brown, 1990). It is, however, the clinical challenge of clinicians to identify factors that influence self care behaviors in their African American patient population. They must then work with those factors in order to have a sustained positive impact on T2DM in patients and their families, given the chronic nature of the disease and its incidence and prevalence in this population.

It is incumbent upon all clinicians who treat African American adults with T2DM to help their patients who struggle with ineffective self care management find solutions and not simply
document that they are “non-adherent”. They must encourage those who achieve success. For those who don't, they must continue to identify ways to help them towards successful self management and not construe that the problem is solely the patient's non-adherence. This state of the science paper will explore factors that influence self-care behaviors of adult African Americans with T2DM and develop specific evidence based recommendations for use by clinicians in primary care of African American adults with T2DM.
Methods

A review of current literature was conducted to establish evidence-based factors that influence self care behaviors in African American adults with T2DM. Electronic databases including the National Library of Medicine - PubMed, CINAHL, Cochrane Library and the Google scholar search engine were consulted using the search terms self-care behaviors, self-efficacy, self-management, education, African American, coping styles, management, type 2 diabetes mellitus. The studies chosen for this paper were those in which the study population contained at least 15% of African Americans in regard to the whole study population and those addressing self-efficacy, social support, outcomes expectancy, health beliefs, education, quality of life, physical activity, diet, coping and well being in relation to self care behaviors. Titles and abstracts of articles selected by the search were reviewed for their relevance to factors that influence self care behaviors in persons with T2DM, and if potentially relevant, the full-text article was retrieved. Key studies were initially identified and relevant bibliographies used as a basis for identifying articles published from 1990 to 2010. Eleven studies addressing factors that influence self-care behaviors of adult African Americans with T2DM were identified. Figure 1 provides an overview of the identified studies. Focusing the study on elderly African Americans was considered; but because of the paucity of data reporting evidence on this sub population this was not possible. Each study was reviewed and the findings placed in a table format with citation/type, purpose, location/age/ethnicity, methods/interventions, and outcomes/findings (Appendix A). The studies were evaluated for their overall validity and then reviewed and compared to identify relevant themes and effective strategies for intervention. Recommendations for clinicians working with adult African Americans with T2DM are made. The research
question of this clinical state of the science paper is: What are the factors influencing effective self-care management for African American adults with T2DM?
Results

Despite the incredible advancements in medicine, African Americans continue to face tremendous challenges regarding preventable and possibly life threatening complications of T2DM. The cause of T2DM essentially does not change from the general population to any specific subgroup. The impact on one aspect of causation (insulin resistance), however, can be influenced by behaviors. The major factors, over nutrition and sedentary lifestyle, (Nathan, 2010) that increase the risk for T2DM are behaviorally based. Dietary tailoring constitutes a fundamental part of management of T2DM. One study used focus groups to identify that food and eating are very important in the African American culture (Anderson et al., 1996). The same study also identified the need for African Americans to learn to interact effectively with healthcare providers and systems. The dilemma herein is not the T2DM, in and of itself, that affects quality of life and possible life span, but rather how one copes with the disease, its stressors and self-care. This review therefore provides insight into the multifaceted and complex nature of the factors influencing self care behaviors of adult African Americans with T2DM and draws attention to this fact for clinical consideration.

The enigma of non adherence to diabetes regimens that have proven to be effective in the control of diabetes has lead clinicians and researchers, alike, to seek out explanations about human behavior that lead to non adherence. In so doing, there is a hope that clinicians can help their patients change their behaviors to care for themselves more effectively. Social cognitive theory, the health belief model, self efficacy, locus of control and their components are frameworks that have been used to investigate issues that explain, predict, and influence behaviors by some of the authors of the studies reviewed herein.
Among the studies identified, four examined self efficacy as a major factor that influences self care behaviors in adults with T2DM. Aljaseem et al. (2001), as part of a larger study, enrolled 304 patients in a one week comprehensive outpatient education program at the Diabetes Center at Hopkins in Maryland. Using the health belief model with the self-efficacy concept as a conceptual framework, patients with T2DM, between ages 24 – 88 were enrolled to examine how their health beliefs and self-efficacy impact their self-care behaviors. The study population was about 50% African American. Self-reporting questionnaires were used to measure the two independent variables of health belief and self-efficacy with regard to self care behaviors. The health beliefs measured showed moderate reliability for the study population (Cronbach's α = .61). The self efficacy scale used showed high reliability (Cronbach's α = .91). Bivariate correlation analyses were performed to examine the affiliation between the independent variables and self care behaviors, and the associations among the independent variables. Self-efficacy was defined as "a judgment of one's own capability to monitor, plan, and carry out diabetes activities in daily life" (p. 396) in this study and contributed to 4% - 10% of the variance in diabetes self care behaviors beyond what was accounted for by patient characteristics and health beliefs regarding barriers. Increased self-efficacy was also found to predict improvements in blood glucose testing, medication skipping, binge eating, and adherence to an ideal diet. Problematic diet and exercise adherence behaviors were found to be associated with perceived barriers to implementing defined self care behaviors. This study found participants’ self-efficacy to depend upon things, such as planning tasks that they felt confident about.

Skelly et al. (1995) used the social cognitive theory (which has a self efficacy component) to find that participants were most effective in the more medical aspects of self
management --- medication and self monitoring blood glucose --- and less effective in diet and exercise behaviors during a first study visit (T1). A second study visit (T2), four months after T1, showed the respondents to be effective in all regimen areas but the observed changes were not statistically significant. At the initial interview (T1) participants completed questionnaires pertaining to self efficacy and confidence in outcomes and a Diabetes Self Care Practices Log (DSPL) tool. The first DSPL was completed with the help of an assistant, whereas the subsequent two were completed one week after the initial study visit and independently. This study population was comprised entirely of African American women with T2DM. The goal of the study was to determine the impact that specified psychosocial variables (perceived self efficacy, confidence in outcomes, selected demographic variables and disease characteristics) have on the self care behaviors of blood glucose self monitoring, urine testing, diet, medication administration and exercise over time. Participants’ expectancies of outcomes were positive. A strong correlation was found between self efficacy and participants’ confidence in outcomes (p < .001). Bivariate analyses of interactions between self efficacy, confidence in outcomes, and self care behaviors showed variances in self care behaviors in T1 and T2 as noted in Appendix A9. Bivariate analyses also showed variances in self care behaviors triggered by confidence in outcomes. Multivariate analyses of interactions between self efficacy, confidence in outcomes and self care behaviors noted that self efficacy had its greatest effect on diet and exercise, while confidence in outcomes affected only blood glucose self monitoring, demographically in T1. In T2 the period of diagnosis was significantly related to self monitoring of blood glucose (p < .02), indicating that self efficacy did have an effect on blood glucose self monitoring and exercise but confidence in outcomes had no significant bearings. One hundred eighteen African American women participated in this study.
Sarkar, Fisher, and Scheeinger (2006) completed a study in a multiracial population in San Francisco, California with 858 patients. Twenty-five percent of the study population was African American. They sought to primarily examine whether self-efficacy has an impact on diabetes self management behaviors of individuals with T2DM living in urban areas with diverse populations and a high prevalence of limited health literacy. Secondly, they wanted to determine if an established relationship between self efficacy and self-management would vary by health literacy scores or along race/ethnicity lines. Oral questionnaires administered in English and Spanish were used for data collection. Univariate analysis yielded the following findings: a) greater the self efficacy was associated with improved the self-management of diet, exercise, self monitoring of blood glucose, and foot care b) no relationship between self efficacy and medication compliance, and c) disease-related factors, disease characteristics, and race/ethnicity, had no effect on the previously noted relationship between self efficacy and self management. The findings of a multivariate analysis yielded the same associations as the univariate analysis. Self management was not affected by sex or low income. Self-efficacy and race/ethnicity, as well as, self efficacy and health literacy exhibited no significant associations. There was a noted improvement in medication compliance amongst African Americans and white participants when self efficacy scores were higher.

Chlebowy and Garvin (2006) studied self efficacy in a biracial cohort where African Americans comprised about 30% of the study population of 191 participants. They had a two-group comparative descriptive study design to examine social support, self-efficacy, and outcomes expectations as they relate to self-care behaviors and glycemic control in Caucasians and African Americans with T2DM. Four self reported measures were used to obtain data in this study. The measures used were a) a Social Support Questionnaire b) an Outcome Expectancy
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Questionnaire c) a Self-efficacy Questionnaire and d) The Diabetes Activity Questionnaire. Glycosylated hemoglobin (A1c) analyses were also completed at clinic visits. In each of the categories studied, the findings were as follows: 1) Social Support: a) no significant relationship was found between social support and self care behaviors in the total group, Caucasians or African Americans b) social support was not significantly related to glycemic control for the total group, Caucasians or African Americans 2) self-efficacy: a) no significant relationship was found between self-efficacy and self care behaviors of the total group, Caucasians, or African Americans b) self-efficacy not significantly related to glycemic control for the total group, Caucasians or African Americans 3) outcomes expectancy: a) a significant relationship was found between outcomes expectancy and self care behaviors of the total group and African Americans; implying that participants would adhere more to a specified diabetes regimen if they believed that it would change their outcomes b) outcomes expectancy was not significantly related to glycemic control in the total group, Caucasians or African Americans. African Americans reported less social support satisfaction than Caucasians, as well as, placed more emphasis on informal social networks than Caucasians for disease management.

A number of studies looked at social support with respect to self care behaviors; Chlebowy and Garvin (2006) was one such study. Another study by Connell, Fisher, and Houston (1992) examined 1) the relationships between specified demographic variables, social support (diabetes specific and perceived availability), morale and self-care behaviors and metabolic control in older adults with T2DM 2) gender differences and possible correlations in the foregoing comparisons, and 3) if morale was affected by social support, self care behaviors, and metabolic control in this adult population. One hundred ninety one community-dwelling volunteers over the age of 60, of which 14% were African American, were recruited for this
study. Detailed interviews were carried out in respondent’s homes. Several measuring scales were used in conducting interviews. Those scales were the 6 item Diabetes Care Profile (DCP), the 17 item Philadelphia Geriatric Center Morale Scale (PGCMS), the Social Provisions Scale (SPS), and two 5 item subscales of the DCP used to measure diabetes specific support (desired and received). Women, compared to men, were significantly older, reported less formal education, had more chronic illnesses (all p values <.05), and were significantly more likely to be African American and lived in senior housing. Men perceived themselves as receiving greater overall social support than women but it was not diabetes specific. Men improved their self care behaviors when the diabetes-specific social support they desired was received and they were able to perceive more involvement with network members. However, when they stated that they wanted more diabetes-specific social support, poor metabolic control was noted. Better metabolic control in the men was related to opportunities to care for others, morale and self care behaviors. Women’s self care behaviors improved with opportunities to nurture others and a desire for diabetes-specific social support. Receiving diabetes-specific social support was related to a decrease in metabolic control; however, when women perceived overall social support, reliable relationships and opportunities for social involvement were available, metabolic control was increased.

A recent small, cross-sectional observational design study by Tang et al. (2008) examined how social support relates specifically to quality of life and self care behaviors in African American with T2DM. Eighty-nine African Americans, age 40 and over participated in the study. The study’s results indicated that social support plays a role in diabetes-specific quality of life and self-management practices. Social support was found to have a significant relationship to education in that greater education led to a lesser likelihood of satisfaction with social support (r
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The study included participants who had been diagnosed with T2DM for varying lengths of time, ranging from 1 to 10 years. The results showed that participants who had been diagnosed for a shorter period of time had higher adherence rates to self-care behaviors compared to those diagnosed for a longer period. The study also found that participants with a higher household income had a higher adherence rate to self-care behaviors. No significant relationship was found between adherence and employment status or years since diagnosis.

In conclusion, the findings of this study highlight the importance of understanding the factors that influence adherence to self-care behaviors in individuals with T2DM. Further research is needed to identify effective intervention strategies to improve adherence and outcomes in this population.
beliefs were not significantly related to adherence. In situations where social support was low, personal control beliefs and adherence were significantly related and negative ($r = -.21, p < .01$), indicating that subjects are less likely to report weight-management regimen adherence when internal health control beliefs are stronger.

Tillotson and Smith (1996) also assessed locus of control, which has its origin in social cognitive theory (Wallston and Wallston, 1982). Locus of control was defined as “an expectancy belief regarding where control over behavior outcomes lies” (Tillotson and Smith, 1996, p. 133). They found that in individuals with T2DM, internal locus of control is a significant predictor of their adherence to weight-control self care measures with a beta weight of -.12 ($P < .05$) in that individuals are less likely to report weight-management regimen adherence when internal control beliefs are stronger. This coincides with Aljasem et al.’s (2001) observation that health beliefs regarding barriers to treatment are associated with self care behaviors.

Training and education is necessary to prepare individuals for self management of their disease process. One study examined the difference between monthly versus 3-month follow up visits made on African American men with T2DM. Measurements were made subsequent to participation in a structured diabetes self-management education program as it related to objective clinical, patient performance, quality-of-life and subjective outcomes (Hendricks and Hendricks, 2000). This investigation was conducted with 30 African American men in Wheaton, Maryland. Self-management diabetes education was provided by certified diabetes educators (CDEs), using the Diabetes Education Society's Lifeskills Diabetes Self-Management Training Program for 2 hours per week for four weeks. The SF-36 health survey was used to assess the health perceptions of study participants. Participants completed history questionnaires and A1c measurements were done. Regardless of the follow up time after self management education, all
participants in this study improved their diabetes knowledge scores, glycosylated hemoglobin and their perceptions of their general health from baseline. What was even more notable is that African American men with T2DM were more likely to report fears of long-term complications of DM such as amputation and retinopathy on follow up. This finding suggests that diabetes educators may need to address the fears of African American men directly and effectively during instruction to increase the probability of longer and healthier lives. The study did recognize that the findings may not be generalizable due to the nonrandom manner of selecting study participants. However, the findings are more important to consider when seeking to minimize the ravaging effects of T2DM on a population that has had the rate of diabetes triple during the past 30 years (Tull and Roseman, 1995).

Several studies have published evidence of physical activity and dietary modification delaying T2DM and its complications. These areas are part of the foundation for diabetes self management. Other studies have identified the need to place particular emphasis on helping the African American community with maintaining dietary and exercise compliance. The findings of Keyserling et al. (2003) in studying 200 high risk African American women, in particular, were no different in this regard. The study proposed to determine whether an intervention tailored to African-American women with T2DM would improve moderate intensity physical activity and dietary behaviors. African American women were randomized into three approximately equal groups; group A: clinic and community intervention, (New Leaf Intervention), group B: clinic only intervention, group C: minimal intervention. (see Appendix 1E for description of interventions). The New Leaf Intervention resulted in a significant statistical increase (p = 0.014) in physical activity among African American women in the study (Keyserling et al., 2003). Even though the study found that the methods used for evaluating dietary intake were inadequate, all
participants in all groups reported reduced intake of saturated fat and cholesterol. However, there was no material effect on serum lipids. The interventions used in the study were found to be acceptable to participants and indicated an improvement in diabetes knowledge. Samuel-Hodge et al. (2000) looked at diet and physical activity affecting the daily self management behaviors of southern African-American women with T2DM to determine the effect of particular culturally relevant psychosocial variables. Seventy African American women were recruited to participate in ten focus groups conducted over five months. The study found that the role of being responsible (physically and emotionally) for multiple family members and friends was perceived to cause stress or create barriers to diabetes self management, especially in areas of diet and physical activity. Participants in this study also reported that spirituality/religiosity was an enormous source of positive emotional support used to deal with all daily challenges, including those related to T2DM.

Coping styles can also play an important role in individual’s approach to self care. One cross-sectional analysis within a randomized control trial examined the relationship between coping styles among African Americans with T2DM and diabetes evaluation, self care behaviors, well-being and quality of life regarding health (Samuel-Hodge et al., 2008). Baseline data was collected through scheduled 90 minute enrollment visits and two subsequent phone interviews from 185 participants. Varying psychosocial and physiological measuring skills and instruments were employed to measure coping styles, perceived stress, diabetes and general health status, perceived diabetes competence and self efficacy, problem areas in diabetes, diabetes self efficacy, spirituality and church involvement, hemoglobin A1c, weight and blood pressure. Physical activity (PA) and dietary behaviors were also measured. Three styles of coping were studied (emotive, active, and passive). The passive form of coping was found to be most used by
participants. Coping styles independently predicted dietary behaviors on one hand, but did not independently explain physical activity behaviors, stages of behavior change concerning diet, or physical functioning.

All of the studies in this review, except as otherwise noted, were performed in the southern parts of the United States. The US Census bureau reports that 55% of the African American community resides in the South (McKinnon, 2003). In July 2008, The Office of Minority Health listed New York, Florida, Texas, Georgia, California, North Carolina, Illinois, Maryland, Virginia, and Michigan as the ten states with the largest Black population (OMH, 2009).

Possible Limitations

In view of the foregoing comparisons and contrasts, it is important to note some possible reasons for differences in findings and the anomalous nature of some findings. The premise within which study questions were framed, methods, interventions, measurement approaches, study population size, precision levels and variable measures are contributory factors. Cross-sectional studies, for example, of which there were five in this review (Figure 1), study data from one point in time rather than over a period of time (longitudinal). The explanations provided by the observed relationships between variables at a designated time can change over time. The interpretations of causality in relationships can also be confounded by variables used and unmeasured factors. In cases where self reporting instruments were used, reporting biases may affect results (Wilson, Biglan, Glasgow, Toobert, and Campbell, 1986). Nonetheless, self-reporting is the most common method of health behavior measurement (Glasgow et al., 2005). Many of the studies recognized methodological and other limitations; notwithstanding, they provide important information to guide ongoing and future practice.
Discussion

Skelly et al. (1995) and Aljasem et al. (2001) used different conceptual frameworks as a premise for their studies to reach similar findings that self efficacy is a strong predictor of compliance behaviors such as medication adherence and self monitoring blood glucose. In addition to diet, Sarkar et al. (2006) were consistent in finding an association between self efficacy and blood glucose monitoring, as were Skelly et al. (1995) and Aljasem et al. (2001). Results from all three of the studies indicated an increased predictive value of self efficacy in relation to improvement in self blood glucose monitoring. Sarkar et al. (2006) and Aljasem et al. (2001) also found that binge eating and adherence to an ideal diet were improved when one felt better about their own ability to monitor, plan, and carry out diabetes activities in daily life; that is, when self efficacy was higher. Skelly et al. (1995) found that self efficacy was less effective in improving diet and exercise behaviors of African American women. Sarkar and colleagues (2006) found no relationship between self efficacy and medication compliance but did find that self efficacy affected foot care. Chlebowy and Garvin (2006), on the contrary, found no significant relationship between self efficacy and diabetes self care behaviors of African Americans nor did self efficacy significantly relate to glycemic control for African Americans. The study design used by Skelly et al. (1995), at two different points in time, suggested that self efficacy can change over time and therefore, contributes differently to adherence over time.

Most of the studies reviewed in this project also identified social support as a factor affecting self management of T2DM in adults, but not all identified a positive relationship between social support and self care in African American adults. Chlebowy and Garvin (2006) was one study that found no statistically significant relationships between social support and self care behaviors. This finding was not consistent with the other three studies in this review that
examined social support in relation to self care behaviors. Connell et al. (1992), in a large metropolitan area study, found a statistically significant relationship between self care behaviors and social support, even though there was some variance in this relationship between men and women. The study by Tang et al. (2008) lent support to the role social support plays in diabetes-specific quality of life and self-management practices. In this study, positive support led to adherence to a healthier diet ($r = .280$, $p < .02$) and increased exercising ($r = .367$, $p < .002$). Negative support behaviors led to participants not following a recommended medication regimen in the week prior to the study ($r = -.348$, $p < .001$). Tillotson and Smith (1996) studied social support in the context of a weight-control regimen. Social support was found to be a significant predictor of adherence to weight-control diabetes regimen.

Skelly et al. (1995) studied diabetes self care behaviors of African American women in the context of self-efficacy and confidence in outcomes to find a strong correlation in these variables though the associations changed with respect to time and specific behaviors. Aljasem et al. (2001) endorsed this finding in stating that “…self-efficacy is not an unqualified good; its value depends on what people feel confident about” (p. 402). Chlebowy and Garvin (2006) had somewhat similar findings when they observed outcomes expectancy for African Americans to have a significant relationship with diabetes self care implying that participants would adhere more to a specified diabetes regimen if they believed that it would change their outcomes. Outcomes expectancy was, however, not significantly related to glycemic control in the latter study.

The role of ethnicity and cultural sensitivity in a chronic disease process such as T2DM is a prevailing point of importance that resounds from this research and its findings. It is important for health professionals to recognize how African Americans identify themselves and express
their beliefs. Even when general patterns are identified, it is also crucial to continue to individualize care. All of the factors discussed in this review will not apply to all African Americans in the same way and to the same degree; neither will the proposed recommendations work for everyone. Notwithstanding, the disproportionate effect of diabetes in African Americans demands attention.

The foregoing discussion enables us to understand that there is not a singularly significant factor affecting the self care behaviors of African Americans with T2DM. It can also be recognized that the factors affecting the self care behaviors of African Americans are not unique to them. The established research obviates some of the ignorance that clinicians may have about ethnic activities that subsequently can lead to ineffective care. The information herein can be used to develop recommendations and/or protocols whilst showing a culturally sensitive and acceptable approach to self-care of African Americans adults with T2DM.

In caring for patients, using a collaborative effort approach, providers must examine their own prejudices, blind spots and short comings that inevitably result from growing up in society. Healthcare providers must be flexible, innovative and open to new ways of seeing and doing things.

Even in this age of medical advancement, T2DM continues to wreak havoc in the African American community. Researchers consequently seek to find answers to reverse the trend by studying factors that can help African Americans improve their diabetes self care behaviors. This literature review uses the information gleaned from researchers to make recommendations for clinical practice in order to help African Americans achieve greater success in self management of T2DM.
FACTORS INFLUENCING SELF CARE BEHAVIORS OF AFRICAN

Management Strategies

The goal of examining factors that influence self care behaviors of African American adults with T2DM is to improve glycemic control. Improvement in glycemic control has been demonstrated to delay the onset and complications of diabetes (Diabetes Control and Complications Trial Research Group, 1993; United Kingdom Prospective Diabetes Study Group, 1998). Dietary tailoring, increase in physical activity, following a medication regimen and monitoring blood glucose are tasks that patients can perform in order to achieve glycemic control, but they must be taught how to do so.

Research recognizes the effectiveness of diabetes self-management education on glycemic control and national standards have been established (Funnell et al., 2008). Self-management education teaches problem solving. There is a growing body of knowledge that recognizes that this education must be culturally planned to better meet the needs of minority populations, like African Americans, who should benefit most from it because of the staggering effects of T2DM on these populations. These effects point to a great need for education and management skills amongst African Americans.

As such, Blanchard, Rose, Taylor, McEntee, and Latchaw, (1999) used a focus group to design a diabetes education program germane to African Americans and noted a substantial difference in what the common facility in the study offered regarding diabetes education versus what the participants desired. Four major themes noted in the findings of the study were 1) “a sense of personal powerlessness, 2) fear related to complications, 3) recognition of knowledge deficits, and” (p. 920) 4) program preferences. The findings of the study pointed to empowering participants by giving them a sense of control over diabetes through diabetes education and incorporating diabetes self-care into real life. The education cannot be a one-time event; but
rather, constant and ongoing with evaluation, which was also a general desire that emerged from the group participants.

In order to receive education, African Americans must use the health care services available to them for screening, prevention, and care (Pichert and Briscoe, 1997). However, researchers report low utilization of services by African Americans. A number of authors have identified barriers and issues that deter African Americans from using existing healthcare services such as diabetes education programs (Anderson et al., 1996; Pichert and Briscoe, 1997). These barriers center on negative attitudes, negative experiences, and cultural barriers. Part of managing individuals’ self care behaviors effectively would then be to recognize that these barriers exist and help problem solve ways to circumvent the barriers.

As African Americans begin to use established health care systems more, Funnel and Anderson (2004) suggest that training and education is most effective if it includes strategies for behavioral change in self care using a collaborative approach. This collaborative approach needs to recognize the role of self efficacy (an integral part of self management education), social support, health beliefs, coping styles, outcomes expectancy, and confidence in outcomes. The collaboration between patient and provider should establish specific goals in a cultural context, recognizing that goals that are not clear or specific (ambiguous) can result in less than maximal results. Providers should, therefore, continue to support goals while maintaining a positive attitude. Supporting behavioral goals set by the patient can prove to an effective form of management (Bodenheimer, MacGregor, and Sharifi, 2005).

Diet and exercise have been shown to be foundational in treating T2DM; however, they have also proven to be the most difficult components of self-management. Most individuals encounter barriers of all sorts, hence the difficulty (Aljasem et al., 2001). Research shows that
barriers lead to patients being less adherent to recommended care plans (Glasgow, 1994). Therefore, identifying and recognizing barriers is an important step in effective diabetes management. El-Kebbi et al. (1996) used discussion groups to report on barriers to dietary therapy among low-income African Americans with T2DM. The information provided from that study indicated that most patients did not find the recommended meal plans to be tasteful and that costs for the recommended way of eating were a deterrent. Participants in this study tended to prefer high-fat foods that were more palatable. This highlights the need for management strategies to consider cultural, social, habitual and economic implications when making nutritional recommendations. The findings of Quatromoni et al. (1994) support this need, though focus groups used in this study were of another ethnic population. Meanwhile, Keyserling et al. (2003) found that the activity of overweight African American with T2DM who had sedentary lifestyles could be enhanced with the delivery of culturally appropriate clinic and community based interventions of moderate intensity activities from peer counselors.
Recommendations

Care of diabetes is predominantly provided in the primary care setting (Rosenblatt, et al., 2001). Overwhelming statistics indicate that this care is ineffective. Will we continue to operate as we have? Time constraints in primary care, coupled with inappropriate infrastructures for care management such as episodic interventions late in a disease process, appear to be the culprits and will likely lead to sustained ineffectiveness in care unless something is done differently. There is an evolving school of evidence that points to a group delivery system of care so as to improve diabetes self-management (Weinger, K., 2003). Based on a review of the literature, recommendations for the self-management of African American adults with T2DM are as follows:

I. Create shared medical appointments for patients with T2DM (Weinger, K., 2003). Between 8 – 20 patients can meet at designated times with a team of providers to include a primary care provider (PCP), a registered nurse or health educator, and a medical assistant. The chosen format and type of shared medical appointment will be dependent on the primary care facility. However, Dr. Noffsinger in the Permanente Journal (Fall, 1999) attests to the undeniable effectiveness of drop in group medical appointments (DIGMA – one form of shared medical appointments) in primary care. Some of the recognized benefits of this type of arrangement, for patients, noted by Dr. Noffsinger are peer interaction (social support), improved care, self help, increased coping skills, access to PCP and/or other medical professional, continuity of care, and increased satisfaction with care. Even providers are able to realize some improved productivity from this kind of arrangement. In shared medical appointments, providers have a vehicle to deliver effective care, teach, reinforce and promote healthy behaviors and can receive increased satisfaction in delivering care (Bronson and Maxwell, 2004). While all of this
is accomplished, patients’ outcomes are improved. It should be noted that shared medical appointments may not be suitable for all.

II. During shared medical appointments, culturally competent diabetes education programs should be provided (Blanchard et al., 1999) to include recommendations consistent with the American Diabetes Association’s guidelines in teaching African Americans about dietary needs and dietary tailoring in T2DM. The empirical evidence of a study conducted by Anderson-Loftin, Barnett, Sullivan, Bunn, and Tavakoli (2002) that yielded reduction in A1C and fasting blood glucose levels and frequency of acute care visits can serve as a template. Even though the study was a small pilot study \((n=23)\), it suggests a viable option. The plan of the intervention notably encompasses many of the factors that influence self-care behaviors discussed in this review:

- Provide low-fat dietary education, in accordance with Food Guide Pyramid, that caters to African American style of eating and food preferences.
- Conduct discussion groups with peers but facilitated by a professional who can provide insight, support, and guidance. Some areas of interest that researchers have studied that can be explored in discussion groups are:
  - teaching patients to recognize dimensions of social support, the quality of social support versus the quantity, and distinguish between support that is constructive versus critical (Tang, 2008)
  - recognizing the different gender needs in social support (Tang, 2008)
  - creating a climate of acceptance that facilitates openness when evaluating patients’ eating behaviors (Aljasem et al., 2001)
- identifying barriers to self-care and working to reduce them (Aljasem et al., 2001)

- Educate patients on purchasing healthy foods and how to read food labels

- Help patients determine strategies for eating away from home

III. Use culturally appropriate and acceptable clinic and community-based intervention programs that are focused primarily on moderate-intensity activities and delivered in part by peer counselors to help encourage a more active lifestyle for patients (Keyserling et al., 2003). Even in so doing, individual differences and preferences always need to be considered and recognized.
Summary and Conclusions

There is not sufficient comparative research to neither exhaustively evaluate nor fully understand the factors that influence self care behaviors of African Americans adults with T2DM and other factors in regards to adherence. A number of studies have examined and identified factors that affect self care behaviors. These include self-efficacy, social support, outcomes expectancy, health beliefs, education, quality of life, physical activity, diet, coping and well being. Knowledge of these factors, however, is insufficient, as the self care behaviors are widely varied across regimen areas. Further study is required to investigate the variety of experiences, barriers, and conditions that could undermine and support these factors. The factors discussed herein, only attest to the importance of those factors influencing self care behaviors of African Americans with T2DM when working with this population to obtain maximal results. Further identifying and understanding of these factors can help clinicians tailor interventions for care so as to help patients incorporate the necessary self-care behaviors into their activities of daily living while respecting human differences and being mindful of human similarities. Health care providers must be flexible in ways of providing care as we seek new and innovative ways of helping patients to achieve their goals. The goal is to use the knowledge of these factors to help ameliorate the lives and outcomes of African Americans adults with T2DM.
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