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Heuristic Model Linking Contextual Processes to Self-Management in African American Adults With Type 2 Diabetes

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PURPOSE

This article examines the influence of various environmental factors on the diabetes self-care practices of African American adults with type 2 diabetes.

METHODS

A heuristic model was developed that considers how community barriers and supports, availability and use of insurance, diabetes education, medical provider-patient relationships, extended family processes, and psychological functioning may indirectly affect metabolic control through the patient's ability to regulate diabetes.

RESULTS

The proposed model offers a framework to demonstrate the complexity of diabetes management that may be unique to the African American experience.

CONCLUSIONS

A comprehensive view of the environmental context will lead to new and more effective approaches in diabetes education and counseling for African American adults with type 2 diabetes.

diabetes mellitus, the most common endocrine disease in the world,¹ is a major clinical and public health problem in the United States. An estimated 15.7 million persons in the United States were diagnosed with diabetes in 1998.² The age- and sex-adjusted rates indicate that type 2 diabetes is a particularly widespread problem for African Americans, particularly impoverished African Americans. African Americans have a disproportionately higher rate of type 2 diabetes, with increased mortality and morbidity from this disease.³ Many African Americans who have diabetes also develop cardiovascular, renal, and neurological complications that can diminish the quality of their lives or cause premature death.

A healthcare professional working with persons who have diabetes must consider not only their clinical needs, but also their financial, psychological, and personal needs. Identifying these needs can help the healthcare professional understand the influences that promote or impede their patients' ability or motivation to care for themselves and, hence, their patients' overall health. Diabetes self-care includes seeking health care (eg, scheduling appointments and arranging for medical follow-up), modifying lifestyle practices (eg, exercising, adhering to dietary regimens, and managing stress) taking insulin or other medications in the correct amounts at the correct times, and regularly examining one's feet. A comprehensive examination of the environmental context (eg, families, neighborhoods, communities, and provider-patient relationships) in which these self-care practices are directly or indirectly shaped can lead to new approaches in diabetes education and counseling for African American adults.

A 1994 report⁴ from the Institute of Medicine on the prevention and treatment of chronic disease underscored the relevance of the environmental-contextual approach for patients with such illnesses.⁴ The report encouraged more research related to the effects of social and physical environments (eg, families, neighborhoods, and communities) on the individual's management of chronic disease. Much of the published research examining the factors that influence self-care among persons with chronic disease has focused on whites or on diseases other than diabetes. Studies pertaining to diabetes have usually addressed type 1 diabetes among children and adolescents. Very few studies have assessed the influence of various environments on self-care practices among African American

adults with type 2 diabetes. Factors that have been found to be associated with self-care in other groups may be associated with this population of interest as well. In some cases, these same factors may not be associated with the population of interest because of differences in sociodemographics, culture, disease type, or self-care demands.

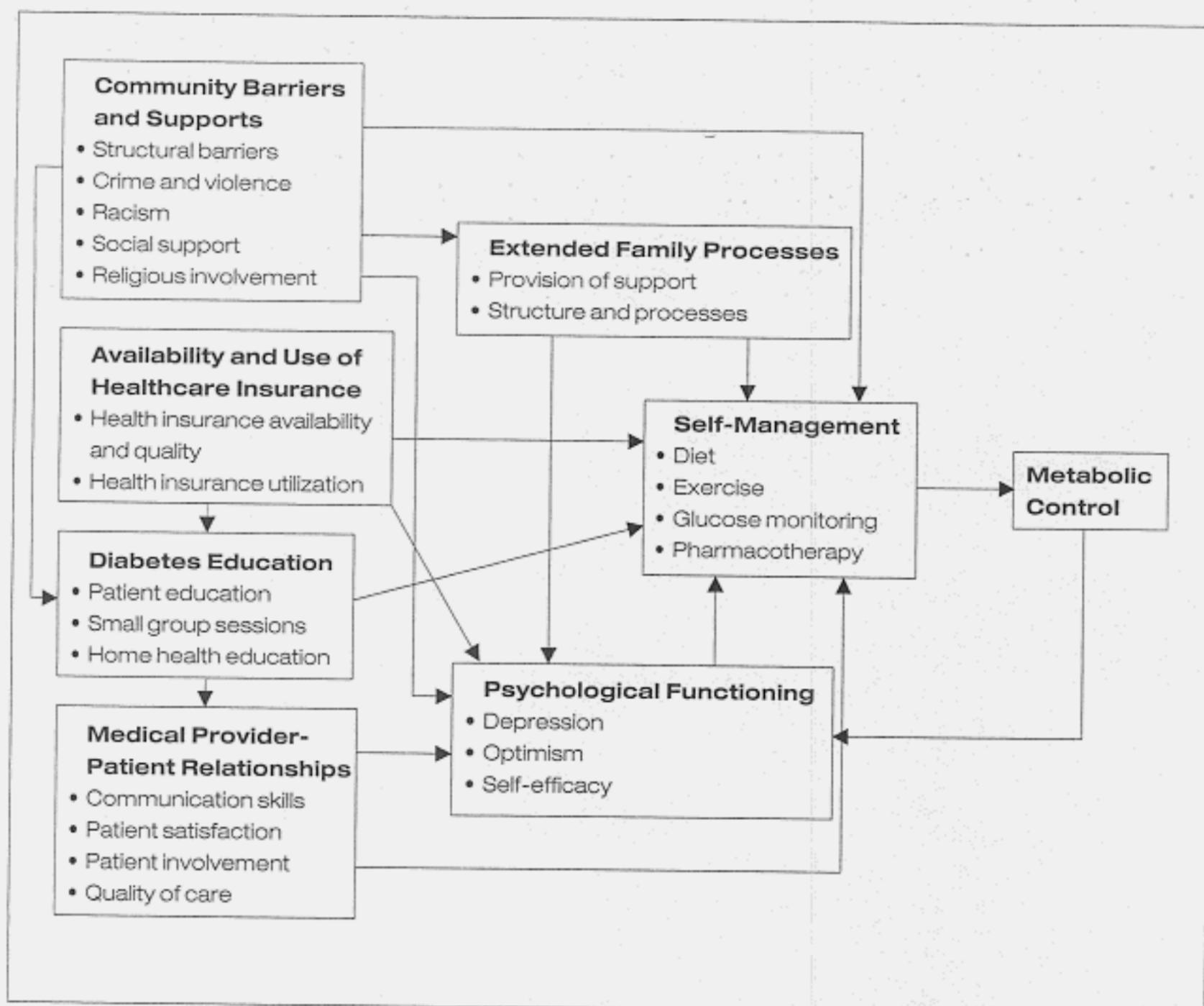
To establish a paradigm for future research, a heuristic framework was developed of the processes that may forecast adoption of self-regulatory regimens among African American adults with type 2 diabetes (see the Figure). This framework promotes the importance of a comprehensive approach that considers how an individual's environmental context helps to shape self-care practices. The framework is based on the integration and collective investigation of interpersonal and intrapersonal factors within 6 domains as potential mediators of self-management and metabolic control: community barriers and supports, availability and use of healthcare insurance, diabetes education, medical provider-patient relationships, extended family processes, and psychological functioning. The known or possible relevance of these domains for African American adults with type 2 diabetes is discussed in this article.

COMMUNITY BARRIERS AND SUPPORTS

Several community characteristics that have been linked to African Americans' quality of life may help to explain the disparities in health conditions between African American adults with type 2 diabetes and other adults with this disease. For example, structural barriers, crime and violence, racism, social support, and religious involvement may indirectly influence self-management of diabetes through the impact of depression, anxiety, and family conflict on diet, exercise, and glucose monitoring.

Structural Barriers

Structural barriers refer to unavailable physical resources that are necessary to support self-management. These resources can include exercise facilities, public health clinics, private physician practices, pharmacies, public transportation systems, grocery stores that sell affordable and nutritious foods, and restaurants that offer healthy menu items. The availability of safe exercise facilities in convenient locations, for example, is a key factor in determining the likelihood that individuals will exercise. In one particular study,⁵



Heuristic model of conceptual and contextual processes that may influence adoption of self-management regimens.

African American adolescents reported limited access to exercise facilities and a paucity of neighborhood resources promoting physical activity. These observations may apply to African American adults as well. In addition, areas with limited public recreational facilities frequently have numerous establishments (eg, fast-food restaurants) that encourage unhealthy eating.

The availability of neighborhood public health clinics, private physician practices, and pharmacies, as well as transportation to these facilities, can also be problematic for African Americans, particularly those living in rural areas. Public funding for health care in rural areas lags behind the national average, and the rural poor are less likely than the urban poor to take advantage of programs that help cover medical expenses (eg,

Medicaid).⁶ Regardless of geographic location, obtaining transportation to healthcare facilities is often difficult for African Americans. Many reported that they did not own a car and often depended on inconsistent and unreliable transportation that their family members and friends attempted to provide.⁶

Crime and Violence

African American adults who live in unsafe neighborhoods report reluctance to leave their homes, express anger toward other family members, and are likely to experience elevated levels of depression and anxiety.^{7,8} Previous exposure to crime or violence in the neighborhood discourages some African American women from exercising in public parks and eating nutritious meals.⁷ Fear of crime and violence may be linked to reluctance to leave home to keep appointments with physicians, attend diabetes education meetings, or engage in outdoor aerobic activities. Fear of crime has also been linked to depression and anxiety, even when stressful life events and daily hassles were controlled.⁷

Racism

Racism is the pervasive and systematic assumption by a certain race or ethnicity of its inherent superiority and its discrimination against other persons solely on the basis of their membership in another racial or ethnic group.⁹ Although institutionalized racism is illegal in the United States, it continues to be expressed in subtle and complex ways. African American adults who experience racism have aroused autonomic functioning that can result in hypertension, anxiety, and depression.¹⁰ Perceived or actual racism from healthcare providers can discourage patients from following through with medical treatments or believing that medical recommendations are trustworthy.¹¹

Social Support

Social support may indirectly affect diabetes self-management and metabolic control through psychological well-being. Low levels of quality social support have been associated with depression¹² and lack of social functioning.¹³ Ethnically similar social networks, particularly those that include other persons with diabetes, may be sources of social support for adults with type 2 diabetes.¹² The effectiveness of patient education and interventions among African Americans may be enhanced by including members of these networks.

Religious involvement

For many African Americans, religion is a means of transmitting cultural values and of providing families with social and psychological assistance.¹⁴ Various forms of religiosity among African American adults, including organizational, nonorganizational, and attitudinal, have been associated with enhanced psychological functioning, positive family relationships, and optimal health.¹⁵ African American adults, particularly those with low incomes, often use prayer to alleviate worry and stress.^{16,17} The African American church, as an institution, provides consistent religious services, health education¹⁸ and screening (eg, for cholesterol, blood pressure, and HIV),^{18,20} assistance to family members experiencing a crisis, and emergency food supply. However it is defined, religious involvement is very likely a viable mechanism in which African American adults receive social support.

AVAILABILITY AND USE OF HEALTHCARE INSURANCE

In a study of African American adults who had diabetes, persons who had public insurance (eg, Medicare or Medicaid) and sought diabetes care were more likely to report optimal blood glucose levels than those who did not have coverage or did not use the coverage they had.²¹ In a study of inner-city residents with asthma, African Americans were more likely than whites to have coverage but less likely to use it.²² Uninsured and publicly insured patients are less likely than privately insured patients to have a private physician as a usual source of care. They are also more likely to rely on hospital-bed care or other emergency resources.²³ Thus, African Americans may be less likely to have consistent healthcare insurance for preventive or acute care. Rather, African Americans tend to use their insurance in the later stages of illness, when treatment is less likely to be effective.

DIABETES EDUCATION

Patient Education

Despite the prevalence of type 2 diabetes among African American adults, very little research has been done to determine whether these patients receive diabetes education, how often they receive it and whether it is effective in promoting self-regulation of the disease. A meta-analysis²⁴ of 82 studies of Caucasian adults with diabetes indicated that

although diabetes education is associated with moderate to large increases in knowledge about the illness and the self-care necessary to manage it, education alone is not sufficient to promote self-care and metabolic control. The effects of education on self-care and metabolic control are small to moderate. In addition, the influence on psychological effects is small.²⁴

Small Group and Home Education

Because of the disproportionate number of African American adults with type 2 diabetes, it is important to identify the educational techniques that are most effective with this population. Small group sessions²⁵ and home health education²⁶ have been found to be among the more effective techniques in diabetes education. These approaches emphasize individualized educational programs while capitalizing on patients' social support networks, physical environment, and personal strengths. Exploration and discussion of participants' perceptions of diabetes and their feelings about having it, as well as discussion of family processes and other life situations that help or hinder patients' adherence to self-care regimens, appear to enhance the programs' effectiveness.²⁶

MEDICAL PROVIDER-PATIENT RELATIONSHIPS

Studies examining characteristics of provider-patient relationships can help uncover why some patients with chronic disease adhere to self-care practices and uncover differences in the quality of care given to such patients. Examining the provider-patient relationship in terms of communication skills, patient satisfaction, patient involvement in medical decision making, and sociodemographic characteristics can help elucidate how these variables are linked to patient self-efficacy and diabetes self-care.

Communication Skills

Patients are less willing to engage in preventive health care when their physicians use poor communication skills such as making abrupt comments, interrupting a patient's sharing of sensitive health information, and appearing inconvenienced by the medical appointment.²⁷ Healthcare providers who listen, ask questions, and express concern help their patients understand the need to assume responsibility for their own diabetes management.²⁸

Patient Satisfaction and Involvement

Adults who perceive their healthcare providers as receptive and supportive of their feelings and needs report greater satisfaction with the relationship.²⁸ Patients' satisfaction with their relationships with healthcare providers is associated with adherence to prescribed healthcare regimens.²⁸

Patients are more likely to consult their physicians for information on health promotion and disease prevention when their time spent waiting to be seen is shorter, exams are longer, and auxiliary medical services for preventive screening and laboratory work are near their homes.²⁹ Patient involvement in medical goal setting and decision making is also related to adherence to self-care routines.²⁹ Patient involvement is a form of shared decision making between the patient and physician and can promote the patient's feelings of self-efficacy, which, in turn, can influence diabetes self-care practices.

Quality of Care

Evidence indicates that the quality of medical care varies as a function of patients' sociodemographic characteristics such as race, ethnicity, language, and age.³⁰ African American women often wait longer for appointments and spend more time in the doctor's office waiting to be seen than do women of other races.³¹ African American patients interpret these lengthy waits as rude treatment. Other studies show that physicians who treat predominantly African American and Hispanic patients are less likely to recommend preventive practices and screening tests than physicians who treat mainly white patients.^{6,32}

EXTENDED FAMILY PROCESSES

The World Health Organization has identified the family as "the primary social agent in the promotion of health and well-being."³³ Examining the family organization and the quality of relationships among extended as well as immediate family members can provide insight into the influence of these important social networks on diabetes management among African American adults. The family is also of primary importance during critical phases of diagnosis and disease management.

Provision of Support

In many cases, the initial decision regarding whether a person needs professional medical attention is made by another family member. Some families, particularly those from racial or ethnic minority groups, identify a "health expert" within the family. This person is often the first person consulted when illness arises in the family.³³ In such cases, the person with diabetes may not make his or her own healthcare decisions. The health expert or other family members may make the decisions or at least heavily influence them. For this reason, family processes are important in promoting healthy behavior and effective management of an illness.

Structure and Processes

Reliance on family and extended kin networks has supported African Americans through multiple family transitions.³⁴ African Americans tend to have frequent contact with extended family members,³⁴ and in many families a relative assists with child care or other tasks.^{35,36} This extended support network functions optimally when all family members agree on the tangible assistance and emotional support to be provided and work together to provide it.³³

Future research involving African American adults diagnosed with type 2 diabetes will help provide opportunities to understand family processes that promote diabetes self-management and ways in which disease characteristics influence family processes.

PSYCHOLOGICAL FUNCTIONING

Behavioral researchers in the field of diabetes care recognize the importance of identifying links between diabetes self-management and psychological states such as depression, anxiety, and stress (arising from both the disease and other situations). These psychological conditions influence patient well-being and can impede the patient's adoption and maintenance of the behavioral changes that health professionals recommend.³⁷ Likewise, positive psychological states such as optimism and feelings of self-efficacy help determine the success of diabetes self-regulation.

Depression

The rate of depression among persons with diabetes is about 3 times higher than in the general US population.³⁸ Among persons with diabetes, depression interferes with the ability to set self-regulatory goals, make plans to meet those goals, and persist until the goals are met. However, poor metabolic control may also induce periods of depression. Although the direction of effects is not clear, other studies have found that depression is associated with poor adherence to self-care regimens³⁹ and poor metabolic control⁴⁰ among persons diagnosed with type 2 diabetes.

Optimism

Optimism mediates the negative effects of anxiety and depression. Optimistic adults cope more effectively with stress, particularly stressors associated with chronic illness.^{41,42} They are more likely to adhere to treatment regimens and to nurture and support others during times of stress. Accordingly, we expect optimistic persons with

diabetes to adhere more closely to their self-care regimens. Future research exploring how optimism mediates the effects of stress and anxiety associated with diabetes will provide valuable information to diabetes educators and other healthcare professionals.

Self-Efficacy

According to Bandura,⁴³ self-efficacy, which includes choice, effort, and persistence in goal-directed activities, is a function of an individual's perception of his or her ability to perform a behavior and belief that the behavior will produce the desired outcomes. A number of studies⁴⁴⁻⁴⁶ indicates a positive association between self-efficacy and actual health-related decisions. Self-efficacy is one of the most powerful contributors to good self-management among patients with type 2 diabetes.

METABOLIC CONTROL

Most of the research on the relationship between regimen adherence and metabolic control has been done with persons diagnosed with type 1 diabetes. Previous studies among persons with type 1 diabetes used measures of adherence that index a variety of self-care regimens (eg, glucose and taking insulin or other medications). Some researchers^{46,47} have found that better adherence to self-care regimens is associated with better glycemic control among children and adolescents. Other investigators who measured a single aspect of adherence found significant correlations between the chosen aspect and glycemic control. For example, among persons with type 1 diabetes, glucose monitoring was positively associated with good metabolic control among juveniles⁴⁸ and adults.⁴⁹ In addition, consistency in administering insulin injections at the recommended times,⁴⁹ use of the amount of insulin recommended,⁴⁹ and regular clinic visits⁵⁰ were each associated with better glycemic control. These aspects of self-management and metabolic control may be relevant to African American persons with type 2 diabetes.

CONCLUSIONS

African Americans are more likely than the general population to have type 2 diabetes, yet little systematic research has been conducted to identify direct and indirect linkages between patient outcomes and the environmental contexts in which African Americans live and interact daily. The proposed heuristic model identifies important domains that may explain the health disparity between African

American adults and members of other racial and ethnic groups who have type 2 diabetes. Use of more limited models with this population (ie, models that focus on one aspect of diabetes management) will not generate the findings needed to enable diabetes educators to provide optimal patient education and counseling.

We propose that community barriers and supports, availability and use of insurance, diabetes education, medical provider-patient relationships, extended family processes, and psychological functioning may indirectly affect metabolic control through the patient's ability to regulate diabetes. A comprehensive view of these factors will lead to new and more effective approaches in diabetes education and counseling for African American adults.

At present, diabetes education has focused on patient-centered interventions that target behavioral and or biological risk factors. These risk factors for type 2 diabetes include genetic susceptibility (family history, ethnicity, age), obesity (duration, degree), central distribution of body fat, lifestyle/behavioral factors (diet, including increased fat/decreased carbohydrates, low fiber, physical inactivity), impaired glucose tolerance, impaired fasting tolerance, gestational diabetes mellitus, insulin resistance (genetic, obesity), cigarette smoking, lack of breastfeeding, and islet cell autoantibodies. Traditional interventions designed to address these behavioral and biological risk factors have included diet modification, physical activities, diet and physical activity, or a combination of behavioral (eg, diet and physical activity) and pharmacologic approaches.

These interventions are the cornerstones of diabetes management. However, without a better understanding of the environments that influence diabetes self-care practices, diabetes education efforts may not fully meet the needs of African American patients. As a result, African American patients may not achieve or sustain diabetes self-care practices over time.

This heuristic model offers a framework to demonstrate the complexity of diabetes management that may be unique to the African American experience. While this framework was conceptualized for African Americans, we realize that there are environmental-contextual similarities to other racial and ethnic groups. The most important issue that must be considered among researchers, diabetes educators, and other health practitioners is that additional research is needed. Future research will need to empirically test complex frameworks designed to identify how diabetes management is mediated by factors in an individual's social and physical environments. Given the increased incidence of diabetes among African Americans, it is important that diabetes education and behavioral intervention research move beyond primarily addressing behavioral and/or biological risk factors.⁵¹ This approach will also assist diabetes educators in interacting closely with African American patients to collectively identify sources of support and strategies that address barriers within their social (eg, family and provider-patient) and physical (eg, recreational facilities, stores with healthy foods, and local restaurants) environments.

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