ADDRESSING CARDIOVASCULAR DISPARITIES THROUGH COMMUNITY INTERVENTIONS

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Objectives: To identify the components and impact of intervention programs aimed at reducing cardiovascular disparities.

Methods: A MEDLINE literature search with key words ''cardiovascular'' and ''African American'' was conducted, and all documented interventions targeted at reducing racial disparities were selected for review. We identified the type of intervention, the populations targeted, the length of intervention, and its impact. Articles that documented scientific evidence and some case reports were reviewed.

Results: Existing studies widely document cardiovascular disparities as they pertain to structure, process, and outcomes. Other factors affecting disparities pertain to patient, physician, system, or treatment factors. Documented programs tend to focus on lifestyle risk factors and attitudes toward those risk factors. The timelines in the studies are relatively short and do not allow for recording clinical endpoints. Most of the studies do not hinge on comprehensive community support, and they lack a sustainability component.

Conclusions: The impact of programs has been short lived, which points to the need for sustainability programs possibly through community partnerships. (*Ethn Dis*. 2006;16:138–144)

Key Words: African Americans, Behavioral Interventions, Cardiovascular Diseases, Compliance, Hypertension, Type 2 Diabetes

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INTRODUCTION

Cardiovascular disease (CVD) is a chronic health condition that affects the heart and blood vessels. It includes coronary heart disease, stroke, hypertension, and rheumatic heart disease. Approximately 59 million Americans have some form of cardiovascular disease. Cardiovascular disease is the leading cause of death of adults in the United States and accounts for ≈960,000 deaths annually.[1] Cardiovascular diseases claim more lives than the next seven leading causes of death combined, including cancer, accidents, influenza and pneumonia, and diabetes. Cardiovascular disease affects African Americans more severely than other populations. Racial disparities in CVD widely exist in outcomes, adherence to treatment, and access to care.

Although African Americans have higher rates of cardiovascular disease than non-African Americans, health promotion and disease prevention are often of low priority because of financial, family, and healthcare constraints. In addition, most low-income persons live in environments that tend to support and even promote high-risk CVD behaviors.[2] African Americans constitute the largest groups at high risk for CVD, but few heart disease prevention programs have effectively reached them. While health promotion interventions leading to personal behavior change reduce CVD in White, middle class, more educated populations, these approaches have not been widely tested in poor, ethnic minority communities.[3] The objective of this paper is to systematically review the existing interventions targeted to African-American populations, and to identify components and impacts of these programs.

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METHODS

Inclusion Criteria

The review included cardiovascular interventions targeted at African-American populations. The eligible types of intervention were those focusing on improving CVD-related health behaviors, adherence to treatment, and access to health care. Eligible outcomes were physical activity, weight control, change in blood pressure, compliance to treatment, utilization of health services, cardiovascular disease, and cardiac death. Studies were included only if they provided enough information on detailed efforts, specific targeted populations, and change of outcomes after intervention.

Literature Research

A computerized search was done in April 2004 by using MEDLINE through the University of Maryland Health Sciences and Human Services Library (covering articles from 1966 to 2004). The following key words were used for the search: ''cardiovascular'' and ''African Americans.'' All findings from the database searches, including abstracts, were downloaded and stored in the reference database program. The eligibility of articles was determined by using three steps. In the first step, titles and abstracts were checked to eliminate

studies in which no interventions were addressed. In the second step, the abstracts of the remaining articles were checked to eliminate studies that did not target African Americans. In the third step, the remaining articles were ordered; final eligibility was determined according to the inclusion criteria listed above.

RESULTS

An Overview of Cardiovascular Racial Disparities

Cardiovascular Disease Among African Americans [Outcomes]

Compared to the general population of the United States, the prevalence of CVD for non-Hispanic Blacks age ≥20 years is much higher—40.5% and 39.6% for men and women, respectively.[4] Mortality rates from cardiovascular disease among African Americans are among the highest in the industrialized world. Based on age-adjusted data from the third National Health and Nutrition Examination Survey (NHANES III) and the Centers for Disease Control and Prevention/ National Center for Health Statistics (CDC/NCHS), the prevalence of hypertension is 25% in the overall adult population, compared with 37% for African Americans.[1] The major adverse clinical outcomes of hypertension, namely ischemic heart disease, stroke, and renal failure, continue to have a substantially higher incidence in African Americans compared with Whites.[5] Further, hypertension may be more aggressive in African Americans and is likely to result in more detrimental end-organ disease. Compared with White persons with hypertension, African-American patients are at higher risk for left ventricular hypertrophy, heart failure, and end-stage renal disease.[6] Disparities exist in the prevalence of diabetes as well; rates of diabetes are 11% and 8% respectively for Blacks and Whites. Within females, it is twice as prevalent in African Americans (14%) as in Caucasians (7%).[1]

In spite of some early literature tracing disparities to ancestry, we now understand that sedentary lifestyles and poor dietary habits prevalent in inner-city populations account for these disparities.[7] Such factors include excess consumption of sodium and foods that contribute to obesity. The strong inverse association between CVD prevalence and socioeconomic class suggests an association with environmental factors, including social stress and instability with respect to education and employment. Other behavioral risk factors, such as smoking, excessive alcohol intake, and inadequate physical activity, most likely play a role in racial differences in CVD prevalence.[8] A possible clinical explanation is the tendency of the kidneys to retain sodium and thereby water in hypertensive African Americans compared to hypertensive Caucasians.[9] Genotypic variants have been also reported to account for the disparity.[10,11]

These findings are reflected in Maryland-specific cardiovascular statistics as well, where the mortality attributed to cardiovascular disease is greater in African-American populations than in Caucasians. In 2001, heart disease mortality was 305 per 100,000 among African Americans and 245 per 100,000 among Caucasians.[12] Stroke mortality in 2001 showed similar disparities, with 77 per 100,000 in African Americans vs 60 per 100,000 in Caucasians.[13] Thirty-one percent of African Americans in Maryland have hypertension compared to 26% of Caucasians.[14]

Racial Disparities in Adherence [Process]

Low levels of formal education can hinder patient comprehension of the consequences of CVD. Regional beliefs and cultural apprehension about mainstream health care contributed to noncompliance.[15] Side effects, such as fatigue, headache, and possibly impotence, further erode patient compliance to medication. Complicated therapeutic regimens, such as multiple drug therapies and multiple daily dosing schedules also present challenges to patients.[16] African Americans and other minorities are less likely than Whites to have their blood pressure regularly checked, and they are more limited in their choice for health care. Most depend on county or municipal hospitals. Lack of supportive care from family members often plays an important role in the compromised adherence to treatment.[17]

The ability of patients to manage their hypertension is crucial because adherence with therapeutic regimens may prevent or delay the onset of complications. African Americans are three times more likely than Whites to die from complications of hypertension.[18] Given the multiple barriers confronted by them, the key to assisting African-American patients with issues related to medication compliance is proactive, nonjudgmental communication. Optimal compliance is more likely to be achieved with simplified medication regimens (eg, a once-daily regimen). Also, physicians should ask all patients if they are taking any nonprescription medications, home remedies, or herbal medicines or using any illicit drugs, because some of these agents may adversely affect blood pressure control.[19]

Racial Disparities in Access to Care [Structure]

Besides multiple cardiovascular risk factors that are particularly apparent among African Americans, another contributor to disparities may be related to underdiagnosis and undertreatment.[20] Disparities in access to care have been classified as related to patients, providers, or systems. Socioeconomic factors can influence physicians' perception of patients, cognition, and perhaps the likelihood of adhering to treatment.[21] Background differences

between healthcare provider and patient contribute to compromised communication and quality of care.[22] Furthermore, race has substantial effects on use of services. Whites are more likely than African Americans to receive a broad range of specific medical procedures, and African Americans are more likely to receive undesirable interventions.[23] Even in studies that adjust for insurance status, African Americans are less likely to receive cardiovascular procedures than Whites. Carlisle et al analyzed medical records on all patients discharged from California hospitals in 1986 and 1988. They found that within most types of insurance (except for those who were privately insured), African-American and Latino patients had lower odds of receiving cardiovascular procedures.[24] People with lower socioeconomic status (SES) are more likely to be uninsured, have low-quality heath care, and seek health care less often; when they do seek care, the problem is more likely to be an emergency.

People of lower SES often tend to be more dissatisfied with the quality of care they receive. Blendon found the level of satisfaction with health care was strongly related to the sector of the healthcare system in which people were seen.[25] The primary finding to emerge from this study was that low-income respondents reported higher levels of dissatisfaction with health care than middle-income respondents. Middle-income persons received their health care through private practices and HMOs. They seldom complained about the sector of the healthcare system in which they were seen. In contrast to middle-income respondents, expressions of dissatisfaction with the healthcare system by low-income respondents were common. Low-income persons spend a much greater proportion of time dealing with the healthcare bureaucracy. They were more frequently troubled with how to access the system and what to do in an emergency.[25] A recent report of the Institute of Medicine (IOM) concluded that racial and ethnic minorities in the United States receive a lower quality of care than Whites[26] after accounting for differential access to care. The report stated that, ''in examining the roots of these disparities, the committee is struck by the fact that the sources are complex and multifactorial. Included among the factors are clinical uncertainty, stereotypical behavior, and conscious bias that may extend all the way to prejudice.'' The findings of the Commonwealth Fund's 2001 Health Care Quality Survey also demonstrate that minority Americans do not fare as well as Whites on a wide range of measures of health quality.[27] These disparities are evident across chronic disease categories, which disproportionately affect older adults.

In sum, racial disparities in cardiovascular health between African Americans and non-African Americans exist in all three categories of healthcare quality measures: structure, process, and outcome. As mentioned in previous sections, environmental factors specific to African Americans[18–20] are likely to lead to compromised treatment adherence. Lack of quality health insurance, miscommunication between African-American patients and their physicians, and a higher likelihood of receiving suboptimal medical interventions can all cause dissatisfaction toward medical care. A resulting fragmentation of care inevitably results in undesirable outcomes, higher rates of hypertension, and poorer disease control. However, with currently limited evaluation and research projects, these issues may have to be better appreciated by health practitioners and policy makers, who stand to make decisions that affect care and outcomes.

A Review of Previous Interventions

Studies Included

The electronic literature research produced 374 articles. Scanning the titles/abstracts revealed 316 ineligible articles in step 1 and 40 ineligible articles in step 2, leaving 18 articles. Of these 18 articles, 10 met the final inclusion criteria (step 3).

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Previous interventions that targeted African-American communities have been mainly focused on changing risky behaviors that contribute to CVD by initiating change in the social, educational, cultural, and physical environment. Unlike various breast cancer interventions, for example, fewer programs are found in the literature that are aimed to improve access to healthcare services, or screening.

Behavioral Interventions

Health behaviors are complex, with personal, cultural, social, economic, and political influences. Health status could be improved if interventions addressed both personal and underlying social factors that influence health behaviors. Most cardiovascular-related health behaviors, such as sedentary lifestyle, high-fat diet, smoking, and heavy drinking, are modifiable. Thus most existing intervention programs are focused on the change of CVD-related health behaviors.

Bootheel Heart Health. Among these interventions, Missouri's Bootheel Heart Health project has proven somewhat successful. It is a community-based intervention that targets the African-American population in a rural, six-county area of southeastern Missouri

during a four-year period. Activities included: blood pressure and cholesterol screening, walking groups, exercise classes, and heart-healthy cooking and nutrition demonstrations. With support from the local health department, the project achieved success, including a significant net decline (−6.8%, P=.03) in the prevalence of physical inactivity and overweight (−5.9%, P=.07).[28] Considering the complicated nature of health behavior, a single theory may not be sufficient to guide the development of comprehensive, successful interventions. Several theoretical models underlying the project were composites of the Social Learning Theory and Stage Theory of Innovation. The former emphasizes that change of behaviors is associated with modification of regulatory, physical, and socioeconomic environments. The latter suggests that new ideas and practices are diffused in discrete stages. The program engaged widespread participation from the community.

East Harlem Healthy Heart Program. While Missouri's Bootheel Heart Health project targeted rural African-American populations with the help of local health departments, some interventions addressed urban African Americans. The East Harlem Healthy Heart Program targeted every segment of the community—children, men, and women—through a variety of channels: work sites, school boards, parent-teacher associations, community centers, daycare centers, churches, supermarkets, etc. For example, to promote healthy eating and consumer education, they forged working partnerships with several community supermarkets. Heart health nutrition tips in English and Spanish were distributed to households, and store owners sponsored annual low-fat milk sales. Annual month-long walking contests were organized, and they were continuously funded by a consortium of organizations even after the project ended. To prevent tobacco use and stop smoking among youth and adults, the Coalition for Smokefree El Barrio was organized. Continued funding was secured through independent sources and community-based activities. This program also achieved its objective of modifying CVD related health behaviors.[2]

Baltimore Church High Blood Pressure Program (CHBPP). One of the other major types of interventions is faith-based cardiovascular health promotion. In African-American communities, particularly among older African-American women, the church community remains the primary source of social support and community leadership.[29] Churches are well-accepted sites for a series of health-promotion and disease-prevention activities, including cancer screening, blood pressure control, weight loss programs, cholesterol education, smoking cessation, stroke prevention, and physical activity.[30–32]

Church-based cardiovascular health interventions in African-American communities are not new. As early as the mid-1980s, CHBPP offered a behavioral-oriented weight-control program to a group of women aged 18–81 years, predominantly African Americans. The program consisted of eight weekly two-hour diet counseling/exercise sessions. After the two-year intervention (1984–1986), subjects achieved significant weight loss and decreases in systolic/diastolic blood pressure.[31]

Church-based intervention has also been conducted in rural areas. Goodfriend et al[33] reported local public health services for seven central Virginia counties. African-American churches were recruited to participate in this program. Participants received four sessions on cardiovascular risk-reduction education and were assessed at baseline and after six months for body mass index (BMI), waist circumference, and dietary fat intake. Lay health workers facilitated the church meetings through faith-based exercise regimens and incentives used as motivators for success and completion of the program; 63% of participants decreased their BMI, 83% decreased waist circumferences, 88% decreased dietary fat, and 99% increased exercise.

Project Joy. While most of the church-based interventions tend to focus on a single behavioral goal, such as weight loss and fruit and vegetable consumption, Project Joy, which was conducted in the African-American community of eastern Baltimore, is among one of the few interventions that targeted globally healthy lifestyles. A total of 529 women from 16 churches were enrolled. They were randomized into three groups: standard group methods with weekly sessions, the same behavioral group model supplemented with a spiritual and church component, and a control group of nonspiritual, self-help interventions. After one year, intervention participants exhibited significant improvements in body weight, waist circumference, systolic blood pressure, and fat/sodium intake, while the self-help group did not. This study demonstrated that church-based interventions can significantly benefit the cardiovascular health of African-American women.

Healthy Hair Starts with a Healthy-Body. Barbershops, beauty salons, and fire stations have also served as places for health educational activities. After researchers involved in church-based programs realized that men were not using the services as frequently as were women, they investigated barbershops as an alternative setting for reaching the male population. Barbershops are present in most communities, and many men visit the barbershops on a monthly basis. Conveniently, they spend some time there, which makes it an ideal setting for screening. Beauty salons also provide opportunities to reach unique audiences not present in other settings. Healthy Hair Starts with a Healthy Body is a program started by the National Kidney Foundation in Michigan in June 1999 to prevent kidney disease. Program partners include the

Michigan Department of Community Health; Diabetes Outreach Networks; American Heart Association; local health department, hospitals; and managed care programs; and 55 stylists from 39 salons. Stylists give their clients a "health chat," brochures, a risk survey, blood pressure check, and a canvas bag of health- and beauty-related incentives.[34]

Healthier People Health Risk Appraisal. Promotions based on work sites can increase healthy behaviors among employees and result in better job performance, and these have been shown to be effective, safe, and acceptable.[35] However, in small worksites, reaching workers often represents economic and access barriers for health workers.[35] Some barriers can be overcome through strategies based on cultural sensitivity. Williams et al reported a successful cardiovascular intervention conducted in daycare centers, where employees were predominantly young and ethnic minority. Healthier People Health Risk Appraisal (HPHRA) was used as a culturally appropriate recruitment strategy to involve a group of child daycare workers in a CVD screening and risk-reduction program and the effect of that program on observable CVD measures. With culturally sensitive educational intervention focused on individual risk and lifestyle, the project substantially improved blood pressure control in the daycare workers.

Pharmacists. Literature has widely documented the roles that pharmacists, nurse case managers, and community health workers have played in patients' education, counseling, and compliance issues. Beyond their traditional task of filling prescriptions, pharmacists can encourage compliance, answer questions, and provide referral when needed. Bogden et al conducted a 6-month trial in a resident teaching clinic, in which the intervention arm consisted of a pharmacist who interacted with physicians and patients on each visit to optimize antihypertensive drug therapy. Patients assigned to the control arm received the same medical care as those in the intervention arm but did not receive input from a pharmacist. At the end of the trial, almost three times as many persons in the intervention arm controlled their hypertension (55% vs 20%, $P<.001$) compared to the control arm.[36]

Nurse and Community Health Worker Case Management. Another study randomized African-American diabetes patients to four intervention arms: 1) usual medical care (control); 2) usual medical care + nurse case manager intervention (NCM); 3) usual medical care + community health worker intervention (CHW); 4) usual medical care + NCM + CHW (combined team intervention). Nurse case managers provided direct patient care, management, education, counseling, follow-up, referral, and physician feedback and prompting, and community health workers monitored participants and family behavior, reinforced adherence to treatment recommendations, mobilized social support, and provided physician feedback. Compared to the usual-care group, the NCM group and the CHW group had modest declines in HbA1C over two years, and the combined NCM/CHW group had a greater decline in HbA1C.[37]

Other. Other interventions that aimed to reduce risky behaviors included an obesity prevention program on the eating behavior of African-American mothers and daughters,[38] training African-American males as peer educators for teaching nutrition, smoking cessation, and healthy-heart habits, and media activities related to cardiovascular health promotion.[39] Virtually all these programs have been short term (up to one year), used process measurements rather than clinical endpoints, and lacked comprehensive support from the community.

Besides these programs focused on behavioral changes, transcendental meditation (TM) has been studied in many previous clinical trials and observational studies. Orme-Johnson and colleagues compared 2000 participants in the TM program to a normative group and found TM participants showed reduced hospital admissions for all 17 disease categories studied, including 87% reduction in admissions related to heart disease.[40] Transcendental meditation (TM) has also been associated with good compliance, lower blood pressure, and enhanced quality of life in elderly White persons as well as in elderly African Americans. Substantial effect sizes have been reported for reduction of systolic and diastolic blood pressure. Although to date, TM has not been used in an intervention, it has been shown to be a potentially effective behavioral technique in the regular care of hypertension and hypertensive cardiovascular disease in African Americans.[41]

To date, few prevention programs have aimed to improve patient, physician, and system adherence and the interactions among these three factors. Most of these programs are short term and do not allow for the measurement of long-term clinical endpoints. Further, existing programs do not seem to have built on collaborations between communities, clinical serving systems at the forefront of delivering medical care, and large-scale medical research institutions that may be more removed from the day-to-day issues of patients.

The Importance of Community Partnership in Reducing CVD

Potential barriers to optimizing blood pressure or blood glucose control are related to factors associated with healthcare systems, provider education and subsequent dissemination of knowledge to patients, patient-provider interactions, and patients' adherence to treatment plans. The JNC 7 report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure stresses health education and adherence

to treatment in achieving blood pressure goals.[42] Issues of physicians' inconsistent adherence to guidelines and patients' low compliance with treatment plans still exist.

As long as community medical institutions, minority-serving systems, and other medical centers operate as individual provider systems, they will not have maximized their potential to reduce cardiovascular risk, even with improved physicians' adherence to guidelines and patients' compliance with treatment plans. The best approach to reducing cardiovascular disparities has to be multidimensional, starting at the community level. Institutions are well positioned to take a leadership role and establish a model for a community of care.

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