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Take Care of Your Health! An Extension Program to Prevent Diabetes

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Abstract: Although the prevalence of diabetes has risen in the general population, ethnic disparities in health are also increasing. The University of California Cooperative Extension worked with Latino and African American adults to develop diabetes prevention programs that motivate people to be proactive about their health, improve cooking practices and eating patterns, and be more physically active. The program, team-taught by Extension and health care professionals, involved three, 2-hour sessions with hands-on cooking. Participants (n=60) reported significant changes in food-related barriers and behaviors. Extension and health entities can complement each other in diabetes prevention efforts that target high-risk communities.

Introduction

Type 2 diabetes is emerging as a serious health problem, especially in high-risk minority communities. The highest rates of type 2 diabetes are found among the African-American, American-Indian/Alaskan Native, and Latino populations (Diamant, 2007). Compared to non-Latino white adults with diabetes, African American and Latino adults with diabetes are also more likely to have poorer control of their blood glucose levels and higher rates of complications (Mainous, King, Garr, & Pearson, 2004; Gonsalves, Gessey, Mainous, & Tilley, 2007; Marshall, 2005). More than 1.8 million California adults, or about 7% of the population 18 years and older, have been diagnosed with diabetes (Diamant, 2007). Individuals at high risk can benefit from efforts to prevent or delay the onset of type 2 diabetes with moderate physical activity, a low-fat diet, and modest weight loss (Williamson, Vinicor, & Bowman, 2004).

Low-income African American and Latinos face multiple and interrelated barriers to diabetes prevention and control, e.g., poverty, lack of access to health care, limited literacy, and cultural values and beliefs that are not considered adequately by the health care system (Rhee et al., 2005; Kieffer et al., 2004; Carlson, Neal, Magwood, Jenkins, King, & Hossler, 2006). Conventional diabetes education programs, including standard weight loss treatment, have limited impact on some African American adults (Wing & Anglin, 1996; Liburd, Anderson, Edgar, & Jack, 1999). Lack of cultural sensitivity and unrealistic weight loss goals of conventional programs may explain the higher dropout rates observed among black compared to white adults. Culturally -sensitive diabetes education and support programs can improve outcomes, even in underserved, low-income populations (Anderson-Loftin, Barnett, Bunn, Sullivan, Hussey, & Tavakoli, 2005; D'Eramo-Melkus et al., 2004; Williams, Auslander, de Groot, Robinson, Houston, & Haire-Joshu, 2006).

Cooperative Extension has become increasingly involved in diabetes prevention programs (Corbin, Kiernan, & Getting, 2007; Williams, LeBlanc, & Christensen, 2004). The University of West Virginia Cooperative Extension offers a program, Dining with Diabetes <http://www.wvu.edu/%7Eexten/depts/famyou/diabetes.htm>. The University of Idaho Cooperative Extension program has used the Idaho Plate Method to teach principles of portion control, along with basic nutrition education, to people with diabetes and their families <http://www.platemethod.com/index.html>. Since 1999, the University of California Cooperative Extension (UCCE) has supported a health promotion workgroup that includes county-based advisors and campus specialists and faculty. The goal of the workgroup is to reduce ethnic health disparities related to diabetes and other chronic diseases in California.

In the formative phase of our work, the workgroup conducted and published findings from seven focus groups, moderated by an African American advisor (UC Health Promotion workgroup, 2002). Participants included 60 African American adults in Santa Clara, San Mateo, San Bernardino, Los Angeles, San Joaquin, and Stanislaus counties. In San Joaquin and San Bernardino Counties, the African American participants commonly mentioned a lack of cultural sensitivity and respect among health care providers. Given the high rate of diabetes among African Americans, focus group participants in San Joaquin County were also very concerned about the overall lack of diabetes prevention information available in their community. They emphasized the need for client-centered information to be presented through community-based programs. Other barriers to change included the taste of foods and social pressures to eat less nutritious foods at family gatherings and in the workplace. Participants also stressed the need for using trained African Americans from the communities to take the message about diabetes and its complications to the people.

The workgroup also previously conducted four focus groups among 28 Latino adults with diabetes and a needs assessment survey among 120 Latino participants in UCCE classes (Kaiser et al., 2003). Although many of those surveyed in the UCCE classes were at high risk of developing diabetes, 44% had never been screened, and 37% did not know where to be screened. The belief that stressful or traumatic events play a role in onset of the disease was predominant among these adults. Individuals who cited more sources of social support had made more behavioral/lifestyle changes after they had been diagnosed than those with less social support.

Based on our research and building on programs in other states, our workgroup developed the Take Care of Your Health program. This article describes an approach that Cooperative Extension in California has used to develop this program to raise diabetes awareness and prevent diabetes and its complications in low-income, high-risk ethnic communities. Below, we provide details on the communities where we pilot-tested the program, steps involved in its development, and participant response to the program.

Pilot Communities

The communities selected for our pilot testing are in San Bernardino and San Joaquin counties, where diabetes rates are above the state average. Prevalence of obesity, hypertension, diabetes, and heart disease are high in these communities, probably due to the racial/ethnic composition and low economic base.

San Bernardino

The population of the Westside community in San Bernardino County is 50% Latino and 30% African American. Households are commonly headed by women, often grandparents raising grandchildren. Large numbers of residents have limited income and lack private health insurance. Most patients rely on Medicare or Medicaid to access care at the community hospital. LaSalle Medical Group and Arrowhead Medical Center Group also provide medical services. The faith community plays an important role in helping its members access health, social, and related services.

San Joaquin

The population of the South Stockton community in San Joaquin County is 43.6% Latino and 15% African American. Health care for low-income South Stockton residents is provided primarily by the county hospital and community clinics. Although several public parks are located in South Stockton, the residents consider them to be mostly unsafe. Dependable transportation is a concern for many low-income residents of this community, making them more dependent on public transportation to access goods and services. From 2000 to 2004, San Joaquin County Public Health had a grant through the Racial and Ethnic Approaches to Community Health (REACH). As part of this project, UCCE in San Joaquin County was funded to conduct

diabetes awareness and prevention workshops that included cooking classes.

Methods

Development of the Curriculum

Since the focus group participants identified the taste of foods as a very important barrier to change, we began our work by convening two forums during which members of the communities prepared recipes selected by the workgroup and made suggestions for either modification or elimination from the program. We also obtained feedback on the layout and presentation of the recipe cards that would be given to the program participants.

Take Care of Your Health incorporated community input, concepts from the Health Beliefs Model (Janz, Champion, & Strecher, 2002), and the Social Learning Theory (Baranowski, Perry & Parcel, 2002). The program was designed for people at risk of diabetes to: 1) motivate and empower them to be proactive about their health care; 2) promote healthy cooking practices and eating patterns; and 3) encourage people to become more physically active. The Take Care of Your Health curriculum <http://anrcatalog.ucdavis.edu/FoodNutritionHealth/3489.aspx> was designed to raise awareness and defuse fear and shame about diabetes; build basic nutrition skills; and help people to set goals to make small changes that will improve their health. A key element was bridging the gap between the health providers and the community by bringing them together to discuss diabetes in an informal and relaxed environment.

Description of the Program

In 2002-2004, UCCE pilot tested Take Care of Your Health in San Bernardino and San Joaquin counties. The program required a partnership between Cooperative Extension and a health care provider in each county. In San Joaquin County, a bilingual certified diabetes educator and the UCCE advisor taught the classes. In San Bernardino, the UCCE advisor was a registered dietitian, so a pharmacist from the same community assisted with teaching the class. The program also drew on the skills of county-based paraprofessional staff who have considerable experience conducting cooking demonstrations in diverse community settings. The program was delivered in three 2-hour sessions, and at least half of each class was devoted to cooking and tasting healthy recipes.

- The first class provided an overview of the types of diabetes, risk factors, and primary prevention of diabetes and emphasized early screening and detection. The Idaho Plate method for controlling portion size was introduced, and participants sampled foods prepared in class. Participants also completed the American Diabetes Association risk assessment test and received a list of local sites where diabetes services are available.

- At the second lesson, a local certified diabetes educator or registered dietitian presented the key components of diabetes management, with an emphasis on dietary modifications. Briefly, the speakers emphasized the effects of carbohydrate, protein, and fat on blood sugar. The program was not designed to provide individual Medical Nutrition Therapy. Therefore, people with type 2 diabetes were encouraged to seek the service elsewhere. Participants learned how to use the Nutrition Facts label to monitor carbohydrate, fat, protein, and other nutrients in foods and reviewed again how to use the Idaho Plate Method.

- The final lesson described the type of care recommended for diabetes management (i.e., how often glycosylated hemoglobin should be measured, foot care, blood lipid screening), and participants learned about diabetes resources in their communities. More time was allowed at the final lesson for the cooking component, to make sure everyone would be actively involved.

Throughout all lessons, we incorporated activities to overcome familial and other social barriers to change, as identified by African American and Latino participants in our focus group research. For example, our lessons included discussions on how to handle the reluctance of family and friends to accept fat- and sugar-modified recipes. Role-playing focused on how to access health information and how to ask the right questions. Participants also discussed ways to incorporate more physical activity into their lifestyles.

One advantage of conducting the program through Cooperative Extension is that county-based UCCE advisors have well-established networks with many community groups. The African American UCCE advisor in San Bernardino recruited participants through the Community Hospital of San Bernardino and Temple Missionary Baptist Church Adult ministry. Due to funding requirements in San Joaquin County, priority for participation was given in Stockton to the REACH support group members and their families. However, we had an agreement with the REACH program that secondary recruitment would be done by UCCE through local agencies, organizations, and churches serving Latinos and African Americans. Project staff personally distributed invitations to the program through several local churches, health-related coalitions/councils, and childcare provider workshops. The participants received a set of 12 full-color, photographed, recipe cards as an incentive.

Evaluation Instruments

The participants completed a participant profile and pre-post questionnaires with items related to health and nutrition practices. The protocol for this program evaluation was reviewed and approved by the UC Davis Human Subjects Institutional Review Board. A brief evaluation instrument was used to determine whether the classes could reduce barriers to accepting low-fat foods, increase self-efficacy in cooking and shopping practices, and change nutrition behaviors related to diabetes management. To examine internal reliability of the instrument, shown in Table 1, we did a Cronbach's alpha test in another, similar group of 50 low-income African American and Latino adults. The results showed the reliability of the items is good, as indicated by a Cronbach's alpha score = 0.70. The Wilcoxon test, a non-parametric test that may be employed where dependent variables are not normally distributed, was used to examine program outcomes.

Results

Sixty participants completed the program. Thirty-two percent (n=19) self-reported race/ethnicity as African American; 52% (n=31), as non-white Latino; 10% (n=6), as Caucasian; and 6% (n=4), as other. Ninety-two percent (n=55) were female. Mean age (± standard deviation) was 48 (± 12.4) yrs. About 38% self-reported that they already had been diagnosed with type 2 diabetes, and most of the remainder had at least one risk factor, including older age, family history, and ethnic background.

Self-Reported Behavior Change

A separate analysis of participants with and without diabetes found the same pattern of responses, so the two groups were combined. Findings from our pilot study (Table 1) suggest that the program lowered barriers to change and modified cooking practices to reduce fat and sugar in the diet. There is also evidence that participants in our diabetes awareness programs were more likely to encourage others to be screened for diabetes. We observed some trends towards positive changes in specific diabetes self-care behaviors, i.e., daily self-blood glucose monitoring, portion control, and follow-up with a dietitian. However, the sample

size of participants with diabetes (n=22) may have been too small to detect significant differences, given the variations in starting level of care and knowledge (Table 2).

Table 1.
Dietary Barriers to Change and Practices Before and After the Intervention Among All Participants (n=60)

Mean Score (± SD)	**Before**	**After**	**P-value** *
1) It is difficult for me to eat more low-fat foods because my family does not like them (1=Agree to 4=Disagree)	2.08 (1.0)	2.33 (1.21)	NS
2) It is difficult for me to eat more low-fat foods because I do not like them (1=Agree to 4=Disagree)	2.40 (1.18)	2.87 (1.17)	0.02
3) How sure are you that you can change recipes to be lower in fat and sugar and make them acceptable to your family? (1=Very sure to 4=Very unsure)	1.97 (0.92)	1.85 (0.92)	NS
4) How sure are you that you can use the Nutrition Facts label found on packaged foods to follow a diet plan? (1=Very sure to 4=Very unsure)	2.07 (0.86)	1.58 (0.79)	< 0.001
% (N)			
5) Do you ever change recipes to make them lower in fat or sugar? (1=yes, 2=no)	67.8 (40)	84.8 (50)	0.02
6) Have you ever encouraged anyone to get a blood test for diabetes? (1=yes, 2=no)	59.3 (35)	76.9 (43)	0.04
* Analysis was done with the Wilcoxon sign test across all response categories for each item			

Table 2.
Changes in Diabetes-Related Self-Care Behaviors and Knowledge Among Participants Who Have Diabetes (n=22)

%, n	**Before**	**After**	**Significance**
1) Do you check your blood sugar at least once a day?	76%, 16	81%, 17	NS
2) Have you ever heard of a glycosylated hemoglobin or hemoglobin A1C test?	81%, 17	95%, 20	NS
3) Do you measure or limit your food portions to control your blood sugar?	65%, 13	80%, 16	NS
			NS

4) In the past year, have you seen a dietitian or certified diabetes educator to learn more about managing your diabetes?	65%, 20	85%, 17	

Responses for all items were yes or no. Pre-post differences were analyzed using the Wilcoxon sign test since the responses are not normally distributed.

Feedback from Participants

In San Joaquin County, the advisor conducted a follow-up informal evaluation, using 11 open-ended questions, with all participants (n=42) at the final session. Sample questions included: what did you like most/least about the program?; how have your changed your food preparation at home; and how can we improve the classes? A participant from San Joaquin County commented, "I liked the friends-help-friends atmosphere. No pressure, no preaching...take what you want and use it."

Including health professionals in informal educational sessions may have helped increase confidence in approaching doctors with questions. A participant with diabetes commented, "I can tell the doctor what I want to know because I know what to ask the doctor. It feels good."

Inviting participants to bring a partner or support person also helped people to deal with social barriers to change. A married couple commented, "Before the classes we used to go to the grocery store and we would argue over what my diabetic husband could and could not have to eat. By coming to class and reading the handouts, the arguments have ended. We now decide together what to buy at the grocery store."

After completing the classes, participants with diabetes often expressed need for on-going support groups to maintain behavioral changes, and some people felt adding more sessions would be desirable.

Implications for Cooperative Extension

Prevalence of type 2 diabetes is increasing rapidly in the US, and it is a significant factor in the rise in health care spending (Koopman, Mainous, Diaz, & Geesy, 2005; Thorpe, 2006). Rates of complications due to diabetes in older Americans have shown little improvement over the past decade (Sloan, 2008). At the same time, the average age of type 2 diabetes onset has dropped from 52 years in 1988-94 to 46 years in 1999-2000 (Koopman, Mainous, Diaz, & Geesy, 2005). Diabetes and other chronic health problems related to obesity are now appearing in young people at such increased frequency that today's youth may be the first generation in modern history to have a life expectancy shorter than that of their parents (Daniels, 2006).

Many health providers have very little time to discuss nutrition topics with their patients. Informal Cooperative Extension programs like Take Care of Your Health can play an important role in preventing or delaying the onset of diabetes by building basic nutrition skills, strengthening support networks, and bridging gaps between providers and the community. With people who have diabetes, Cooperative Extension education is probably most effective if focused on primarily on healthy cooking and shopping practices and access to community resources. Diabetes education provided in community gathering places can be an important adjunct to clinical care and is effective in helping patients achieve glycemic control (Norris et al., 2002). Working in partnerships with health professionals, Cooperative Extension educators can meet critical community needs for health promotion and disease prevention programs. The Take Care of Your Health model can be adapted to allow educators to reach particular audiences, for example older Americans, limited literacy, or low-income, by using appropriate activities and different cultural foods.

Cooperative Extension has great potential to raise awareness of diabetes and its complications and contribute to chronic disease prevention in diverse audiences. For example, California has more than 400,000 in-home caregivers for older and disabled Americans who could benefit from being trained on components of the Take Care of Your Health program. Health promotion through Cooperative Extension partnerships with churches, worksites, and community clinics are other venues that could be pursued more aggressively. While some Cooperative Extension programs specifically target low-income clientele, diabetes (and obesity) prevention is needed in all population groups. Secular trends in dietary quality show that the gap between the rich and poor narrowed from 1971-2002, mainly because the diet of the affluent groups has deteriorated (Kant & Graubard, 2007).

A more formal evaluation with a larger sample size, a control group, and a longer follow-up is needed. However, rigorous evaluations of this type of intervention are costly and difficult to conduct. As a first step, we have identified some key behaviors that are sensitive to change and measurable in a Cooperative Extension program. We plan to examine correlations between these behaviors and biochemical indicators, including glycosylated hemoglobin and cholesterol values. Upon validating brief instruments that are easy to use, we can then identify settings that yield the greatest impact from a Cooperative Extension, health provider, and community approach to raise diabetes awareness and promote healthful lifestyles.

Conclusion

Type 2 diabetes is emerging as a serious health problem, especially in high-risk minority communities. The demand for information related to diabetes among Extension clientele is expected to increase, in part due to aging and other demographic changes in the US population. To continue offering educational programs that are relevant to the public's need, Extension professionals need to explore new partnerships with health care entities and use models like Take Care of Your Health to raise awareness of and prevent problems related to diabetes.

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