Original Report:
Diabetes

Diabetes Education, Specialty Care, and Self-Care Advice among Obese African American Women with Type 2 Diabetes

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Objective: *Healthy People 2020* (*HP2020*) includes benchmarks for diabetes management. The objective of our study was to describe diabetes management among African American women, a patient group that carries a disproportionate diabetes burden.

Design: Cross-sectional survey study.

Participants: African American women with type 2 diabetes enrolled in dietary and weight management interventions.

Main Outcome Measures: Self-report assessments of diabetes education, specialty care, self-care behaviors and advice. Associations between diabetes self-care behaviors and diabetes advice using Chi-square tests.

Results: Among 96 participants (age = 53 ± 9.4; BMI = 37.9 ± 7.3 kg/m^2), reported diabetes education and foot exams were lower than *HP2020* benchmarks, 48.9% vs 62.5% and 35.1% vs 74.8%, respectively and higher for dilated eye exams (70.1% vs 58.7%). The most frequently reported dietary advice was to increase fruit/vegetable intake (58%) and approximately 50% reported physical activity advice. Receiving no exercise advice was associated with greater odds of little or no physical activity (OR = 3.38) and planned exercises (OR = 2.65).

Conclusion: Receipt of diabetes education and some specialty care were below national benchmarks while health care provider advice influenced patient self-care behaviors. Increasing diabetes education and specialty care should be included within existing efforts to address the excess diabetes burden experienced by African American women. Longitudinal studies exploring the relationship between health care provider advice and self-care behaviors are needed. *Ethn Dis*. 2016;26(2):229-234; doi:10.18865/ed.26.2.229

Keywords: Diabetes; Diabetes Preventive Care; African American Women; Diabetes Nutrition Counseling; Diabetes Physical Activity Counseling

Introduction

The American Diabetes Association recommends that all persons with diabetes receive diabetes self-management education (DSME) and referral to specialists for supplemental care.[1] Diabetes self-management education, the "cornerstone of treatment for all people with diabetes,"[2] has been effective in assisting patients in managing their type 2 diabetes.[3-5] Moreover, the involvement of specialists, such as podiatrists and ophthalmologists, is an equally important factor in the prevention and management of diabetes complications.[1]

Given the increasing morbidity, mortality and financial burden of diabetes in the United States,[6,7] *Healthy People 2020* (*HP 2020)* goals includes benchmarks for DSME and specialty care. For example, a 10% increase in the numbers of diabetes patients receiving formal diabetes education, annual dilated eye exams, and annual foot exams are projected.[8] To date, however, there is very little information describing existing patterns of diabetes education and specialty care among groups who experience the highest diabetes-related morbidity and mortality burdens, ethnic minorities[9,10] and those who are obese.[11] Among obese African American women with type 2 diabetes, our descriptive study highlights receipt of formal diabetes education, specialty care and diabetes self-care advice. In addition, the relationship between self-care behaviors and receipt of advice is described.

Materials and Methods

Eligible participants were African American women with a clinical diagnosis of type 2 diabetes for ≥ 6 months and who were at-risk for development and/or progression of

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diabetes-related microvascular and macrovascular complications (HbA1c ≥ 7.0%, and either systolic blood pressure of ≥130 mm Hg, LDL cholesterol ≥100, or BMI ≥30). As part of group-based dietary self-care[12] and weight management interventions, participants were recruited using managed care organization referrals and radio, email, flyer and church advertisements. Study protocol was approved by the Meharry Medical College institutional review board.

Participants completed a written demographic and medical/self-care history questionnaire, including questions about receipt of formal diabetes education and annual dilated eye and foot exams. The dilated eye and foot exam questions were consistent with Behavioral Risk Factor Surveillance System diabetes module questions[13] and were followed by inquiries about the presence of vision or neuropathy symptoms, respectively. Receipt of dietary and physical activity advice from health care providers was assessed using the Self-Care Recommendations component of the Summary of Diabetes Self-Care Activities (SDSCA) questionnaire.[14] In addition, as part of the SDSCA, participants reported the number of days/week they engaged in specific dietary and physical activity behaviors. Participants received $20 in cash to offset participation-related expenses.

Among obese African American women with type 2 diabetes, our descriptive study highlights receipt of formal diabetes education, specialty care and diabetes self-care advice.

Descriptive statistics were expressed as mean and median for continuous variables and as percentages for categorical variables. Associations between dietary and physical activity advice on dietary and physical activity behaviors, respectively, were assessed using Chi-square tests. All analyses were conducted using SPSS software version 22 (IBM SPSS Statistics, IBM Corporation, Chicago, IL).

Results

The participant profile *(N*=96) in Table 1 depicts a middle age (age = 53 ± 9.4 years), obese (BMI = 37.9 ± 7.3 kg/m^2) group with glycemic control levels slightly above the recommended goal of ≤ 7%[1] and the majority having health insurance (89%) and employed (88%).

As shown in Table 2, approximately half (48.9%) reported formal diabetes education. The majority (70.1%) had received a dilated eye exam within the last year. Seventeen percent confirmed vision problems; 75% of whom had received a dilated eye exam in the last year (data not shown). More than one-third (35.1%) received a foot exam in the last year. Thirty-three percent reported symptoms of neuropathy; of these, 31% had received a foot exam in the last year (data not shown).

Relative to dietary advice received, eating five servings of fruit and vegetable was reported by the largest percentage of participants (57.7%), followed by calorie reduction as a weight loss method (47.4%) and limiting sweets (44.3%). Percentages reporting advice about a low-fat and high-fiber diet were comparable. Advice to follow a complex carbohydrate diet was reported by the least percentage of participants (18.6). Approximately half of the respondents reported receiving physical activity-related advice, including: incorporating low-impact exercise (50.5%); exercising at least three days/week (46.4%); and fitting exercise into the daily routine (55.7%). Approximately 10% reported getting advice to engage in a specific type, duration and level of exercise. For both dietary and physical activity advice, approximately 10% reported no advice or uncertainty about having received advice.

Table 3 shows the associations between not receiving self-care advice and level of engagement in self-care behaviors. Participants who reported receiving no advice to engage in low-impact exercises and incorporating exercise into their routines had approximately twice the odds (OR = 2.43) of low-level participation (0 to 3 days per week) in a specific exercise, including walking, compared with those who reported receiving advice. Receiving no advice to exercise continuously for 20 minutes at least 3 times/week was associated with greater odds of low-level weekly participation in getting any type of physical activity (OR = 3.38) and engaging in

Table 1. Baseline participant characteristics and *s*elf-care behaviors (N=96)

Age – years, mean ± SD	53 ± 9.4
Some college or above, %	76.4
Income (%)	
<$10,000	21.3
$10,000 - $20,000	21.3
$20,001 - $40,000	23.4
$40,001 - $60,000	13.8
>$60,001	10.6
Not reported	9.6
Employment, %	
Work outside the home full-time	45.8
Work outside the home part-time	6.3
Homemaker	9.6
Retired	6.0
Other (disabled, self-employed)	18.8
Unemployed	12.5
Insurance, %	
Employee health insurance plan	56.3
Private health insurance	3.1
Medicare	18.8
Medicaid	10.4
No insurance	11.4
Marital status – single, %	36.6
Hemoglobin A1c –%, median (range)	7.5 (5.4, 14.0)
BMI–kg/m^2, mean ± SD	37.9 ± 7.3
Diabetes duration – years, median (range)	7.5 (.25, 42)
Days/week eating high fat foods such as red meat or full-fat dairy products, mean ± SD	3.0 ± 2.0
Day/week eating five or more servings of fruits and vegetables, mean ± SD	3.7 ± 2.0
Days/week participating in at least 30 minutes of physical activity, mean ± SD	2.8 ± 2.2
Days/week participating in a specific exercise, mean ± SD	2.4 ± 1.0

a specific exercise (OR = 2.65). Those receiving any type of dietary advice had decreased odds of low-level engagement in dietary self-care activities.

Discussion

Compared with *HP 2020* specialty care benchmarks,[8] study participants reported higher rates of dilated eye exams. Given that African Americans have a disproportionately higher risk for developing retinopathy[15] and dilated exams are important in reducing this risk,[16] this is a particularly positive finding. An equally positive finding is that among those reporting vision problems, the majority had received a dilated eye exam. Reported rates of foot exams, however, were lower than *HP 2020* objectives, 35.1% vs 74.8%; among those reporting neuropathy symptoms, the majority had not received a foot exam. In light of the known disproportionate burden of diabetes-related amputations among African Americans,[17] along with the fact that getting foot exams is associated with high morbidity and emotional costs to individuals and financial burdens to the economy,[18] these trends may exacerbate disparities.

Receipt of formal diabetes education was also lower than *HP 2020* objectives. The effectiveness of formal diabetes education among African Americans is known.[3-5] Therefore, the lack thereof among approximately half of our participant population, may limit their ability to fully benefit from support offered through formal education.[19] While there are likely many factors, beyond just availability, that influenced whether participants engaged in formal diabetes education and received eye and foot exams, it will be important to further explore those that promote or hinder receipt of services. This is particularly salient when lack of insurance, a common barrier to receiving these services,[20,21] may not be a significant factor as in our mostly insured participant group.

Table 2. Diabetes education, specialty care, and self-care advice, education, and lifestyle counseling (N=96)

Education, Specialty Care and Advice	% Reporting Education/ Specialty Care/ Advice
Formal diabetes education class	48.9
Dilated eye exam within the last year[a]	70.1
Dietary advice[b]	
Follow low-fat eating plan	38.1
Follow complex carbohydrate diet	18.6
Reduce calories to lose weight	47.4
Eat high fiber foods	37.1
Eat at least 5 servings a day of fruits and vegetables per day	57.7
Limit sweets	44.3
Other dietary advice[c]	23.7
No dietary advice or unsure	10.3
Physical activity counseling	
Low impact exercise like walking	50.5
Fit exercise into daily routine	55.7
Engage in a specific type of exercise	10.3
Other physical activity advice[d]	7.2
No physical activity advice or unsure	9.3

a. 17% reported symptoms of vision problems.
b. 3% reported neuropathy symptoms.
c. Limit salt, fried foods and soda; increase water intake; manage carbohydrates; eat smaller, more frequent meals.
d. Water aerobics and other pool exercises.

The most frequently reported dietary advice was consistent with diabetes medical nutritional therapy guidelines (eg, eat high-fiber foods, limit sweets) and specific recommendations for overweight/obese individuals (eg, reduce calories to lose weight).[22] The least frequently reported advice was for complex carbohydrate consumption. This is a particularly important observation given that the management of carbohydrate intake is a key strategy for glucose control[1] and related advice, if followed, might reduce consumption of simple carbohydrates that negatively impact blood glucose control. The most frequently reported physical activity advice was also consistent with diabetes guidelines, 150 min/week

Table 3. Relationship between dietary and physical activity advice and self-care behaviors

	Adjusted OR (95%CI)
No advice to follow low-fat eating plan (49.5%)	
Low weekly consumption[a] of high fat foods	.761 (.32-1.18)
No advice to eat at least five servings of fruit and vegetables per day	
Low weekly consumption 5 fruits/vegetables per day	.461 (.195-1.09)
No advice to get low level impact exercise like walking (42.3%)	
Low weekly participation[a] in at least 30 minutes of physical activity (including walking)	2.07 (.90-4.77)
Low weekly participation[a] in a specific exercise (including walking) other than home- or job-related work	2.43 (1.02-5.79)[b]
No advice to exercise continuously for 20 minutes at least 3 times a week	
Low weekly participation[a] in at least 30 minutes of physical activity (including walking)	3.38 (1.43-7.98)[c]
Low weekly participation[a] in a specific exercise (including walking) other than home- or job-related work	2.65 (1.12-6.28)[b]
No advice to fit exercise into the daily routine	
Low weekly participation[a] in at least 30 minutes of physical activity (including walking)	1.60 (.70-3.67)
Low weekly participation[a] in a specific exercise (including walking) other than home- or job-related work	2.43 (1.02-5.79)[b]

a. Low weekly consumption or participation (0 to 3 days per week); Reference group is those receiving advice in each category.
b. P≤.05.
c. P≤.005.

of moderate-intensity aerobic physical activity.[1] It is noteworthy that for both dietary and physical activity, the highest percentage reporting receipt of recommended advice was approximately 50%. In view of our findings that receipt of no advice, specifically for physical activity, is significantly associated with lower levels of engagement in self-care activities, it is of critical importance to ensure that all patients receive, minimally, the advice recommended in professional diabetes guidelines. This should complement efforts to address other factors that influence self-care behaviors among those at highest risk for diabetes-related complications (eg, access to self-care resources such as safe areas to walk).

…among those reporting vision problems, the majority had received a dilated eye exam.

Study limitations include use of a cross-sectional study design for which no temporal causation can be inferred. Second, a convenience sample of mostly insured participants was included, limiting generalizability of these findings to other ethnic groups or those who are either uninsured or underinsured. Lastly, the findings from the survey were self-report, plausibly introducing recall bias and social desirability biases.

Conclusion

Type 2 diabetes is a complex disease that requires substantial lifestyle and personal behavior changes. As a consequence, it is critical that patients with diabetes receive adequate and sometimes ongoing diabetes education, specialty care, and self-care advice to better manage their condition and prevent complications. This study provides evidence that, among a group with the highest risk of development or progression of diabetes complications, lapses in these critical diabetes management components exist and that there is a relationship between receiving self-care advice and engaging in self-care behaviors. Increasing diabetes education, specialty care and health care provider advice should be included among existing efforts to address the excess diabetes burden experienced by this patient group. Future work should include exploring factors (eg, insurance-based incentives/policies, best ways to link patients to specialty referral networks) that may promote high uptake of specialty care services, such as eye exams in this study, will be important for maximizing such efforts.

Acknowledgments and Compliance with Ethical Standards

The Meharry Medical College institutional review board approved the study and all procedures followed were in accordance with the ethical standards of the IRB and the Helsinki Declaration of 1975, as revised in 2000. All participants provided written informed consent. Procedures included a verbal summary of major consent form components (eg, purpose, benefits, risks) by the research assistant after which participants could ask questions. Participants then read the consent form independently and signed.

Conflict of Interest

No conflicts of interest to report.

Author Contributions

Research concept and design: Miller, Akohoue; Acquisition of data: Miller; Data analysis and interpretation: Miller, Cunningham-Erves, Akohoue; Manuscript draft: Miller, Cunningham-Erves, Akohoue; Statistical expertise: Cunningham-Erves, Akohoue; Acquisition of funding: Miller; Administrative: Miller, Cunningham-Erves; Supervision: Miller

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