Original Article

Social support and diabetes self-management behavior among Caribbean, Caribbean American, and African American women: A descriptive correlation study

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ABSTRACT

Background: Type-2 diabetes (T2D) is one of the most prevalent chronic and noncommunicable conditions both domestically and globally. The objective of this descriptive study was to examine how perceived social support impacted self-care management behavior among female African American and Caribbean populations. **Materials and Methods:** The cross-sectional study recruited 42 African American and Caribbean women diagnosed with T2D (M = 69.1, SD = 12.0). Univariate and bivariate analyses were conducted to explore the relationship between (1) demographic characteristics, (2) desired and received social support variables, and (3) self-management behaviors. **Results:** Caribbean women residing in the United States were more likely to follow general diet (M = 5.38, SD = 1.43) and to engage in physical activity (M = 4.31, SD = 2.39), whereas African American women were more likely to follow a specific diabetes diet (M = 3.79, SD = 1.60) and to monitor their glucose (M = 5.70, SD = 1.75). Caribbean women living in the United States Virgin Islands were more likely to follow recommended foot care procedure (M = 4.65, SD = 1.36). A negative correlation occurred between female participants exercising and the desired support in exercising. Women who reported that they desired more support with physical activity exercised less (r_s = −0.34; P = 0.04). No relationship was found between foot care procedure and demographic characteristics or social support variables (i.e. desired or received). **Conclusion:** This study suggests directions for future studies that would examine the dynamics of social support and T2D self-management behaviors, and this study might be relevant to other Caribbean and African American communities with T2D both in North America and the Caribbean.

Key words: Diabetes, minority women, self-management, social support

INTRODUCTION

Type-2 diabetes (T2D) is one of the most prevalent chronic and noncommunicable conditions globally and domestically. This lifelong chronic disease impacts nearly 347 million individuals worldwide,[1] and it continues to escalate in diagnosis and symptomatology.[2,3] With the expected population growth, increased aging population,

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and urbanization with associated lifestyle change, researchers have predicted 54% global increase in the diagnosis of T2D by 2030.[3] Of the four classifications for diabetes mellitus, T2D accounts for more than 90% of individuals being diagnosed with diabetes.[4-7] Although T2D affects a larger part of the world population, some populations are disproportionately impacted by T2D.[3,8]

As a racial group, African Americans have the highest burden for T2D in the United States. It is estimated that 13.2% of African Americans are diagnosed with T2D as compared to 7.6% of non-Hispanics Whites.[9] Foreign-born Blacks (i.e., Afro-Caribbeans) are often included in this statistic.[10] The average prevalence of T2D is estimated to be approximately 9% in the Caribbean countries.[11,12] Similar to the African American population in the United States, the Black Caribbeans in the United States Virgin Islands (USVI) are more likely to have diabetes than their counterparts in other Caribbean islands.[12-16]

Besides the high prevalence of T2D among African Americans and Black Caribbeans, this population also confronts similar complications, such as low health literacy, health beliefs, and accessibility of culturally sensitive information, all impediments which make it difficult to render proper care.[17] Despite these barriers, social support has been shown to encourage and promote self-care management.[18]

Theoretical background

Seminal and current works have documented the protective effects of social support in the reduction of risk for mental and physical health.[19-21] To understand how social relationships influence an individual's health and well-being, Kahn and Antonucci[22] proposed the convoy model of social relationships. According to this model, individuals are surrounded by their social system.[22] For this study, the convoy model suggests that as women move through life, they derive support, identification, and a sense of contentment and continuity from their social relationships.[22,23] An individual convoy of relationships is predicated on the reactions to and expectations of support.[24] In terms of gender, women reported (1) having more frequent contact within their social system, (2) having larger and more multifaceted social networks, (3) having more satisfying relationships with their friends, and (4) providing more support than men offer.[25] As women age and confront a myriad of chronic conditions, their close relationships (i.e. family and/or friends) are likely to affect their ability to adapt to the challenges they encounter along the health continuum.[26,27]

Social support and type-2 diabetes management

Social support is an intricate concept, which coincides with multiple social networks (i.e., family, occupation, community, and institution) surrounding an African American woman. Social support has the potential to exert more positive than negative influences on the woman's ability to self-manage her condition.[28-33] Researchers have found that families often play a key role in the everyday instrumental tasks of diabetes care, especially within minority families.[31,34] Social support has been examined in diverse forms as it relates to the facilitation and hindrance of female patients' self-management of chronic diseases.[31,33,35-37] In a qualitative study, Madden *et al*.[37] found that women diagnosed with T2D were more likely to successfully manage their conditions – if a family member had been previously diagnosed with T2D – than those women without a family member previously diagnosed with T2D. Likewise, in a sample of 46 women, DePalma *et al*.[36] found that negative family interaction predicted ineffective diabetes management, such as diet and glucose monitoring.

Although studies have focused on social support within the female African American or Black female Caribbean populations,[13,17,32,34] research has been sparse in investigating diabetes-specific social support of both Black female Caribbean and African American female populations residing in the United States or part of the US territories (i.e. USVI). To fill the gap in the literature, the purpose of this study is to examine the perceived social support and its effects on self-care management practices among female African American and Black female Caribbean populations.

Materials and Methods

Design

This study employed a descriptive, cross-sectional design to explore the relationship between the respondents' self-management behavior and their perceived social support. Participants were recruited from health and humans services facilities (i.e., senior centers and senior apartment buildings) in the USVI and Connecticut. To participate in the study, women (1) had to self-identify as being either Black female Caribbean or female African American, (2) had to be diagnosed with T2D for more than 6 months, and (3) had to be 45 years of age or older. Data collection consisted of participant demographics, social networks and social support, general health status, comorbidities and index disease, and self-management patterns. We expected a small sample size in our recruitment efforts. Many factors influenced

the sample size of the study. For example, the authors had to consider the recruitment logistics among Caribbean women internationally and domestically as well as the cost of implementing the study. Although the sample size is small, it is deemed acceptable because the study focused on assessing clarity of survey and ease of administration.[38]

Ethics approval

All procedures for this research project were approved by the Protection of Human Subjects Division of the Institutional Review Board at the University of Connecticut and the University of the Virgin Islands (e.g., IRB #H13-154, IRB #H13-316, and IRB # H11-215 PITT, respectively). All participants reviewed and signed informed consent forms before participating in the study.

Measures

Measures for social support were based on a reliable and valid instrument, the Diabetes Care Profile (DCP),[39,40] to assess the social and psychological factors related to T2D. Scale reliabilities (i.e., Cronbach's α) ranged from 0.75 to 0.90.[39,40] The DCP assessed the reliability among female African Americans with T2D (Cronbach's α =0.93).[40] The diabetes-specific support-received (DSSR) scale,[41,42] a subscale of the DCP, assessed the extent to which these African American females received specific support from their social network in the following ways: (1) Following a meal plan, (2) taking medicine, (3) following a foot care procedure, (4) getting enough physical activity, (5) testing sugar levels, and (6) handling feelings about diabetes. A 5-point ordinal response format was used, with higher scores indicating greater amounts of support received (range 6–30).[41,42] The study scale's internal consistency was adequate for an exploratory study – Cronbach's α = 0.81.[43,44]

The diabetes-specific support-desired (DSSD) scale,[41,42] a subscale of the DCP, assessed the extent to which these African American females desired assistance from their social networks in the form of tangible and emotional support.[42] The items in this scale directly paralleled the DSSR scale. High scorers desired more support than low scorers (range = 6–30).[41,42] Cronbach's alpha for this scale was 0.79.[43,44]

The summary of diabetes self-care activities (SDSCA) originally assessed five areas of T2D management behavior during the past 7 days: (1) General diet, (2) specific diet, (3) exercise, (4) blood glucose monitoring, and (5) foot care procedure.[45] The Cronbach's α for the summary score was 0.71, 0.42, 0.71, 0.87, and 0.46 for each of the subscales, respectively.[45] Modifications within the survey included adding items, such as medication compliance and smoking.[45] The SDSCA has been used in several research studies.[46,47]

Data analysis

Before analysis, variables were tested for normality. Descriptive statistics were gathered on demographic characteristics, self-care activities, and diabetes-specific support variables. To simplify analysis, marital status, education, and employment status were recorded as follows: Marital status: 1= "Married," 2= "not married," and 3= "cohabiting;" education: 1= "High school graduate/general educational development or less" and 2= "some college or more;" employment status: 1= "Working" and 2= "retired." A Chi-square analysis was performed to compare demographic characteristics and independent variables between the two groups. Bivariate analysis was conducted to explore the relationship between (1) demographic characteristics, (2) social support desired and received variables, and (3) self-management behaviors. If the parametric assumptions were met, the Pearson correlation coefficient was utilized to determine the relationship between variables measured on ratio or interval scales. To address the nonnormality of variable distributions, Spearman's rho correlational was used for bivariate analysis.

Results

The participants' characteristics are compared by location as shown in Table 1. The mean age of the total sample was 69.1 years, with Black Caribbean women residing in the United States representing the oldest cohort (P = 0.39). Significant differences occurred in years of diagnosis and educational levels. African American women were more likely to have the longest length of T2D diagnosis (P = 0.050) and have an education beyond high school (P = 0.008). No significant differences were found in the body mass index (BMI), average and percentage of comorbidities, marital status, employment status, smoking behavior, and health status. Although the total sample was obese (BMI = 31.2 kg/m^2), the BMI for Black Caribbean American women (BMI = 28.5 kg/m^2; P = 0.27) was less compared to Black Caribbean women residing in the USVI and African American women (BMI = 31.8 kg/m^2, 32.0 kg/m^2, respectively). Furthermore, Black Caribbean American women were more likely to be married (25%), and they were more likely not to smoke than their counterparts. Black Caribbean women living in the USVI were more likely to report the most comorbidities (M = 3.8). African American women were more likely to be retired (90%).

Although no significant differences between the independent variables existed [Table 2], Black female

Table 1: Sociodemographic characteristics

Characteristics	Total sample (*n*=42)	Caribbean US residents (*n*=8)	African Americans (*n*=10)	USVI (*n*=24)	*P*
Age (years), mean (SD)	69.1 (12.0)	74.0 (8.4)	66.3 (13.3)	68.6 (12.4)	0.39
BMI (kg/m^2), mean (SD)	31.2 (5.2)	28.5 (4.8)	32.0 (6.21)	31.8 (4.8)	0.27
Years of diagnosis, mean (SD)	13.3 (6.7)	12.2 (4.6)	17.9 (8.7)	11.6 (6.1)	0.05
Comorbidities, mean (SD)	3.6 (1.5)	3.2 (1.7)	3.5 (1.3)	3.8 (1.5)	0.56
Marital status					
Married	16.7	25	20	12.5	0.65
Not married	78.6	62.5	80	83.3	
Cohabitation	4.8	12.5	0.0	4.2	
Education					
<High school	69.0	62.5	30.0	87.5	0.008
>High school	31.0	37.5	70.0	12.5	
Employment status					
Working	19.0	37.5	10.0	16.7	0.30
Retired	81.0	62.5	90.0	83.3	
Comorbidities*					
Hypertension	90.5	100.0	100.0	83.3	0.64
Arthritis	59.5	62.5	70.0	56.5	0.76
Depression	28.6	14.3	30.0	38.1	0.50
Serious fall	21.4	25.0	10.0	26.1	0.56
Asthma/emphysema/ COPD	16.7	0.0	30.0	17.4	0.28
Stomach ulcers	19.0	25.0	20.0	17.4	0.90
Other comorbidities	30.9	12.5	30.0	26.0	0.66
Smoking					
Yes	5.0	0.0	10.0	4.5	0.62
No	95.0	100.0	90.0	95.5	
Health status					
Excellent/good	55.0	62.5	59.1	40.0	0.29
Fair	37.5	37.5	27.3	60.0	
Poor/very poor	7.5	0.0	13.6	0.0	

*Column total exceeds 100% because many subjects had more than one chronic condition. USVI: United States Virgin Islands, BMI: Body mass index, SD: Standard deviation, COPD: Chronic obstructive pulmonary disease

Table 2: Descriptive statistics for independent variables

Characteristics	Total sample (*n*=42)	Caribbean US residents (*n*=8)	African Americans (*n*=10)	USVI (*n*=24)	*P*
General diet, mean (SD)	4.68 (1.72)	5.38 (1.43)	5.28 (1.28)	4.17 (1.45)	0.12
Specific diet, mean (SD)	3.22 (1.64)	3.09 (1.66)	3.79 (1.60)	3.00 (1.67)	0.45
Exercise, mean (SD)	3.46 (2.66)	4.31 (2.39)	1.90 (2.46)	3.88 (2.66)	0.09
Glucose test, mean (SD)	4.21 (2.83)	4.63 (3.10)	5.70 (1.75)	3.39 (2.92)	0.09
Medication, mean (SD)	6.61 (1.33)	7.00 (0.00)	7.00 (0.00)	6.25 (1.77)	0.22
Foot care, mean (SD)	4.41 (1.44)	3.69 (1.39)	4.45 (1.59)	4.65 (1.36)	0.27
DSSD total, mean (SD)	13.67 (6.69)	11.13 (7.70)	12.70 (5.66)	15.10 (6.69)	0.32
DSSR total, mean (SD)	15.23 (6.72)	12.63 (5.97)	12.70 (5.92)	17.43 (6.82)	0.08

DSSD: Diabetes-specific support-desired; DSSR: Diabetes-specific support-received; USVI: United States Virgin Islands; SD: Standard deviation

Caribbeans residing in the United States were more likely to follow a general diet (M = 5.38, SD = 1.43) and exercise (M = 4.31, SD = 2.39), compared to African American and Black USVI women. African American female T2D patients were more likely to follow a specific diabetes diet (M = 3.79, SD = 1.60) and glucose monitoring (M = 5.70, SD = 1.75), compared to both Black Caribbean women living in the United States and the USVI. Both women residing in the United States (African American and Caribbean) self-reported 100% compliance in taking the medication as prescribed by their physicians. Black Caribbean women living in the USVI were more likely to follow a foot care procedure (M = 4.65, SD = 1.36). It is important to note that DSSD (M = 13.67, SD = 6.69) and DSSR (M = 15.23, SD = 6.72) were low for the total sample.

Demographics and diabetes-specific support are correlated with diabetes self-care activities as shown in Table 3. The longer a woman was diagnosed with T2D (r_s = 0.36; P = 0.03), the more likely she followed a general diet. A negative correlation occurred between the number of comorbidities and general diet. Participants who reported less than three comorbidities had healthier eating habits (r_s = −0.38; P = 0.03). Participants who reported a positive health status ate healthier foods (r_s = 0.35; P = 0.03). In addition,

Table 3: Correlation of participant characteristics, summary of diabetes self-care activities scores, and diabetes-specific support scores (*n*=39)

Variables	Summary of diabetes self-care activities											
	General diet		Specific diet		Exercise		Glucose testing		Medication		Foot care	
	r	*P*	*r*	*P*	*r*	*P*	*r*	*P*	*r*	*P*	*r*	*P*
Age	0.03	0.86	−0.22	0.18	0.14	0.40	0.07	0.69	0.19	0.27	0.05	0.78
BMI	−0.29	0.09	−0.22	0.19	0.03	0.85	−0.09	0.57	−0.01	0.10	0.24	0.14
Years of diagnosis	0.36	0.03	0.07	0.70	−0.18	0.29	0.38	0.02	0.00	0.99	0.19	0.25
Comorbidities	−0.38	0.02	−0.16	0.37	0.04	0.84	0.15	0.38	−0.17	0.34	0.15	0.39
Marital status	−0.02	0.93	0.11	0.49	−0.04	0.82	−0.25	0.12	0.16	0.35	−0.27	0.09
Education	0.22	0.20	0.38	0.02	−0.25	0.13	0.07	0.67	−0.01	0.97	0.13	0.44
Health status	0.35	0.03	0.12	0.47	0.08	0.63	0.16	0.34	0.35	0.03	−0.21	0.20
Help desired in meal plan	−0.02	0.93	0.04	0.04	−0.01	0.96	−0.06	0.71	−0.27	0.11	−0.19	0.24
Help desired in taking medications	−0.04	0.82	0.30	0.07	0.08	0.63	−0.03	0.88	−0.18	0.30	0.05	0.75
Help desired in taking care of feet	0.12	0.46	0.36	0.02	0.15	0.36	0.01	0.97	−0.03	0.13	0.06	0.73
Help desired in getting physical activity	−0.01	0.97	0.27	0.09	−0.34	0.04	−0.18	0.27	−0.19	0.26	−0.16	0.32
Help desired in testing glucose	−0.07	0.66	0.25	0.12	−0.04	0.83	−0.08	0.63	−0.02	0.93	−0.27	0.10
Help desired with feeling for T2D	0.08	0.063	0.20	0.23	0.17	0.31	0.12	0.48	−0.27	0.10	0.16	0.34
Help received in meal plan	0.25	0.14	0.18	0.27	0.06	0.74	0.08	0.63	−0.33	0.05	−0.09	0.58
Help received in taking medications	−0.00	0.98	0.24	0.15	−0.60	0.72	−0.05	0.78	−0.03	0.87	−0.03	0.86
Help received in taking care of feet	−0.08	0.65	0.26	0.12	0.07	0.66	−0.17	0.30	−0.23	0.17	0.03	0.85
Help received in getting physical activity	0.08	0.65	0.06	0.70	0.06	0.72	0.29	0.08	−0.21	0.21	0.08	0.65
Help received in testing glucose	−0.11	0.52	−0.05	0.78	0.19	0.26	−0.14	0.40	0.02	0.89	−0.07	0.69
Help received with feeling for T2D	0.06	0.72	0.12	0.46	0.13	0.43	0.06	0.72	−0.27	0.10	−0.21	0.21

BMI: Body mass index; T2D: Type-2 diabetes

participants who had an education beyond high school (r_s = 0.38; *P* = 0.02) felt supported in meal planning (r_s = 0.04; *P* = 0.04) and followed a foot care procedure (r_s = 0.36; *P* = 0.02). Participants were more likely to report that they followed dietary guidelines specific to managing T2D.

A negative correlation occurred between participants exercising and the desired support in exercising. Participants who reported that they desired more support with physical activity exercised less (r_s = −0.34; *P* = 0.04). Participants were more consistent in self-reported glucose monitoring, the longer they were diagnosed with T2D (r_s = 0.38; *P* = 0.02). Participants who reported positive health status were more likely to self-report adherence to a T2D medication regimen (r_s = 0.35; *P* = 0.03), but they were less likely to receive support in meal planning from friends and family members (r_s = −0.33; *P* = 0.05). No relationship was found between foot care procedure and demographic characteristics or between social support variables (i.e. desired or received).

Discussion

The purpose of this study was to explore the relationship between diabetes-specific support and self-care management practices among female African American and Black female Caribbean populations. Because social support is a multidimensional concept, this study investigated T2D specific to desired and received social support variables. Research indicates that social interactions with family and friends play a significant role in diabetes management. These findings contrast to those reported in previous research, in which satisfied support was reported to be associated with better self-management behavior. Low social support or assistance among family members has a prominent impact on diabetes self-management.[36] Vest *et al*.[48] found that family members assisted in the day-to-day activities of T2D self-management behaviors. However, similar to prior studies, this study showed that women diagnosed with T2D often experienced conflicting demands in their day-to-day diabetes management.[34,49] Social support therefore may not be uniformly and automatically beneficial among female caregivers.[17,47,50] Special importance should be considered among women's social networks as they pertain to providing diabetes-specific social support to improve self-management behaviors.[51]

Unlike previously published findings,[26,27] this study suggests that T2D-specific social support plays a minor role to specific T2D self-management behavior among those Black female Caribbean and female African American participants, except following a foot care procedure. However, certain findings in this study were consistent with other studies. Similar to Whittemore *et al*.,[52] Black female Caribbean and female African American participants who experienced greater support were more likely to follow their dietary plans. Additional studies found social support as an influential predictor in dietary adherence, physical activity, glucose monitoring, and taking medication as recommended.[53,54] Similar to Chlebowy and Garvin,[55]

this study did not find an association between social support and some self-management behaviors (e.g., diet or physical activity) although Chlebowy and Garvin used general social support instead of diabetes-specific support. Perceived emotional support (i.e. received and provided) was insignificant in the sample. The lack of perceived emotional support may be due to negative family interaction between participants and family members.[36]

This study found no association between T2D-specific social support and following a foot care procedure among the sample of Black Caribbean and African American women. This lack of association was in conflict with Belgrave and Lewis,[56] who found a positive association between social support and following a foot care procedure, if the source of support came from their spouse or adult child. Although a positive association was found between social support and certain self-management practices, a negative association was found with physical activity and taking recommended medication. This study's findings emphasize the importance of negative family and other social relationships, which is consistent with Schafer *et al*.'s[57] research. They found that adults diagnosed with type-1 diabetes who perceived negative social support from family members showed poorer adherence to medication. However, unlike Schafer *et al*.,[57] this study did not find similar findings to glucose testing and diet. Maybe, the perceptions of adults with type-1 diabetes, that is, seeing negative social support, differed from the observations of adults with T2D.

In a series of studies that have included prospective assessment, Trief *et al*.[58] and Trief *et al*.[59] demonstrated the importance of paying particular attention to spousal interactions and marital quality in promoting adherence to the diabetes self-management regimen. These two studies highlighted the importance of changes to the social environment that may assist in disease self-management. This study, however, consisted of predominantly unmarried older women, whose social networks consisted of children, other family members, and friends. The study found that female participants were less likely to exercise if they reported wanting more support from family and friends. Family members and friends have greater influence on observable self-management behaviors as opposed to self-management behaviors performed in solitude.[60] Physical activity is an observable behavior that is likely to occur in social settings. This study found that participants were less likely to exercise if they reported wanting more support from family and friends. It is not known if the participants of this study would increase the amount of physical activity if they had support from their family members or friends. Participants in the study may not have exercised as much due to limitations, such as a lack of physical function or multiple chronic conditions. These reported limitations may have been due to more than three chronic conditions (i.e., hypertension, arthritis, and depression), which are associated with lower activity levels.[61,62] Conversely, taking medication is typically a behavior conducted alone. In this study, individuals with T2D may have had less opportunity to receive social reinforcement with reminders to take medication by family members and friends. The reminders may have been viewed as so-called "nagging." The findings, while broadly supportive of our study, raise important new questions about how social relationships affect progressing chronic conditions in an aging population.

The primary limitation of our study is its small sample size. As a result, our findings may be imprecise. In particular, our study included only 42 subjects and was biased toward older female patients.[38,63,64] It is therefore likely that important findings, which are not reflected in the current results, may be found with a larger number of study participants.[38] More studies with larger sample size of Black Caribbean and African American women are needed to measure diabetes specific to social support among multicultural groups. Second, the study was limited by the quality of data used in the analysis. Consequently, it is possible that the female respondents provided answers they considered socially acceptable.[64] Further concerns, which pertained to the study's small sample size, focused exclusively on reproductive outcomes. Despite our small sample size, this study was able to gain valuable insight into the role of social support among diverse black women diagnosed with T2D.

Due to the cross-sectional design, the study design lacks the ability to prove causality. This limitation makes it difficult to determine if social support, desired or received, improves diabetes self-management behaviors. Maybe, individuals who are successfully adhering to self-management behaviors perceive their families as more supportive because of a more general positive view of the world. Longitudinal studies, which are experimental designs that permit the examination of causal elements, qualitative data, and mixed-methods approaches, can also provide important additional information. Future work might focus on creating culturally tailored programs for women with T2D who would benefit from family-centered interventions. Furthermore, future research could evaluate whether or not the intervention served to enhance family support and positively transform health behavior. To ascertain the degree to which the family acts as a facilitator

or hindrance, the convoy model suggests (1) an examination of the structure of the individual's support networks, (2) the support exchanged, and (3) the evaluation of the support provided. Additional research studies should include elderly Black Caribbean women with diabetes residing in the United States and the USVI and those who have had diabetes for many years. The developmental tasks of the family may differ when compared to African American women with diabetes.

Although self-report is unavoidable and even desirable, other measures would benefit from more objective appraisals of the participants' circumstances. In their self-report of disease management, participants may give biased responses or exaggerate their adherence to their medical regimens. Utilizing self-reported instruments may have influenced the results. In general, future studies should account for these limitations to fully convey the complex nature of diabetes self-management behaviors and social support for Black Caribbean and African American women diagnosed with diabetes. Consideration of more specific measures and a more varied participant population could provide different results. The number of T2D cases continues to rise in North America and the Caribbean, especially within racial and ethnic minority groups.[1] To this end, future research must address the limitations faced in the current study to help Black female Caribbean diabetes patients identify social support to assist with diabetes self-management behaviors.

Conclusion

Despite these limitations, this study has value in providing empirical results among Black Caribbean women and African American women diagnosed with diabetes because these results relate to social support and T2D self-management behaviors. This study suggests directions in future research that would examine the dynamics of social support and T2D self-management behaviors. This study might be relevant to other Caribbean women (non-Afro-Caribbean) with T2D both in North America and in the Caribbean.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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