



Family influences on type 2 diabetes self-management: Perspectives of African American adults with food insecurity

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ABSTRACT

Background: Prior studies have established relationships between diabetes management and food insecurity and highlighted the role of family support in diabetes management. However, there remain gaps in understanding how families influence diabetes self-management within the context of food insecurity. This study aimed to explore the impact of family dynamics on diabetes self-management among food-insecure African American adults.

Method: We reanalyzed qualitative data from two focus groups with 16 African American adults to explore how family influences diabetes self-management among food-insecure individuals with Type 2 Diabetes. The original research used a grounded theory approach to examine broader challenges, barriers, and support in diabetes care.

Results: We identified four themes that characterized family influences on different aspects of diabetes self-management, including diet, exercise, stress, and self-care routines, for African American adults with type 2 diabetes who reported food insecurity. The themes include Changes in Diet and Exercise Routines, Family Assistance with Diabetes Self-Management, Conflict between Self-Care and Family Responsibilities, and Adapting to Family Situations.

Conclusion: Our findings from food-insecure African Americans with type 2 diabetes reveal that families significantly influence diabetes self-management, confirming similar outcomes from research with other populations. Given their distinct sociocultural and economic characteristics, there is a clear need for family-inclusive diabetes self-management education and support explicitly tailored for African American adults living with diabetes while experiencing food insecurity.

1. Introduction

Diabetes was a growing health problem globally, and the eighth leading cause of death in the US [1–3]. About 38 million Americans live with diabetes, with 90–95 % living with type 2 diabetes [1, 4]. Compared to the diabetes prevalence rate of 8 % in non-Hispanic White adults, African Americans have a prevalence rate of 12.5 %, poorer glycemic control, higher rates of diabetes-related complications, and more diabetes-related deaths compared to non-Hispanic White individuals [1,5–8].

African American households also have higher reported rates of food insecurity compared to their White counterparts [9]. Food insecurity, the restricted or uncertain access to enough nutritious and safe food for an active and healthy life [10], is a social determinant of health that is

particularly relevant to individuals with diabetes. Prior studies showed significant associations between food insecurity and poor diabetes outcomes, including poor glycemic control and increased prevalence of diabetes-related complications [11,12]. Food insecurity can be measured at both the individual and household level and is often linked to factors such as lower socioeconomic status and housing instability [13].

Social support plays a strong role in diabetes, with the family in particular shaping the physical and social environment in which diabetes self-management occurs, including dietary practices, self-care routines, and resource availability [14–18]. Prior studies show that African Americans are more inclined to reside in multi-generational households where family members depend on each other for physical and psychosocial support [19,20]. Within these intergenerational

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households, individuals share the burden of social risk factors, including housing instability, financial instability, and food insecurity, which can adversely affect individuals' ability and capacity to manage their diabetes effectively [12,20,21]. An increasing body of evidence has shown that families can support or obstruct an individual's effort to manage diabetes [16,17,22,23]. In a systematic review and meta-synthesis, Vongam and colleagues found numerous studies describing family behaviors that are supportive or non-supportive of diabetes self-management [16]. Such helpful roles include providing informational, financial, and instrumental support, such as helping with activities of daily living, reminding family members with diabetes to take their medications, helping individuals identify acute changes in their condition, and being a source of motivation. However, non-supportive behavior can include family members withholding support or engaging in behaviors that negatively impact diabetes self-management [22].

While existing studies examined the role of food insecurity on diabetes management and the role of family support in diabetes management, there are gaps in understanding how families influence diabetes self-management within the context of food insecurity. The goal of this study was to explore the impact of family dynamics on diabetes self-management among food-insecure African American adults, using data from focus groups conducted with food-insecure African American adults with type 2 diabetes.

2. Method

2.1. Study design and methodology

This study uses qualitative data from two focus group sessions involving 16 African American adults. The primary study by Walker and Colleagues utilized a grounded theory approach to investigate the challenges, facilitators, and barriers to effective diabetes care for food insecure African Americans with Type 2 Diabetes (T2D) and identify interventions to address these barriers [24,25]. Focus group is a data collection technique designed to leverage participants' interaction to delve deeper into their shared experiences, beliefs, and perspectives, thereby gathering rich data about a phenomenon of interest [26]. The current study reexamines the data from the initial focus groups to understand the impact of the family on diabetes self-management among food-insecure African American adults.

2.2. Settings and participants

Focus group discussions were held at community-based sites located in inner-city Milwaukee [24]. Participants in the primary study were purposefully selected from food pantries. Recruitment flyers advertising the study were placed in food pantries in inner-city Milwaukee, with individuals able to refer themselves and referrals provided by food pantry workers. Inclusion criteria included adults aged 18 or older, self-identification as African American with a diagnosis of type 2 diabetes, and self-report of food insecurity. Food insecurity was determined by participants' self-reported difficulty in obtaining enough food or worry that food would run out before they had money for more over the prior year [24]. Selected participants were African American adults who had a shared experience of living with type 2 diabetes while coping with food insecurity and were willing and able to share those experiences in a focus group setting [24].

2.3. Data collection

In the primary study, two focus group interviews were conducted among 16 participants, with each group discussion lasting an average of 90 min [24]. Two facilitators and two co-facilitators led the focus group discussions. Facilitators (LE and RW) asked questions and moderated the discussions, while two co-facilitators took notes and provided session

summaries. Discussions were conducted in English. Interviews were guided by a moderator guide, which consisted of open-ended questions that explored challenges and barriers to managing diabetes, the role of food insecurity in managing diabetes, and facilitators and resources that improve diabetes management [24]. Follow-up questions and probes were used to encourage participants to elaborate on their answers or provide more details or clarification. Focus groups were audio-recorded and transcribed to allow data analysis.

2.4. Data analysis

Transcribed results collected from the original focus groups were analyzed to answer two new questions in this study:

Question 1. How does the family influence participants' diabetes self-management?

Question 2. What family-shared beliefs, values, and practices facilitate or inhibit participants' diabetes self-management?

Data were analyzed inductively using a thematic analysis approach [27]. We began by immersing ourselves in the data by reading and re-reading the transcripts from transcribed audio-recorded sessions, field notes, and descriptive summaries. We did the above to familiarize ourselves with the data and document initial ideas [27]. Then, we assigned descriptive codes to words, phrases, sentences, or paragraphs with specific meanings. The transcripts were meticulously examined in accordance with the initial codes, followed by a repetitive process of coding and recoding.

Subsequently, patterns and variations within the data were identified and deliberated upon as provisional themes. SI and LE engaged in detailed discussions to finalize themes.

2.5. Rigor

Different strategies, including adequate sampling, concurrent data collection and analysis, prolonged engagement with data, and use of different data sources, were integrated during the primary study as well as this secondary analysis to ensure the credibility and trustworthiness of study findings [28]. The primary study recruited individuals with type 2 diabetes who reported food security [24] to obtain insight from people who have direct knowledge and experience with the phenomenon of interest. Concurrent data collection and analysis were done using probes and follow-up questions to avoid misunderstandings and ensure an in-depth understanding of participants' perspectives. Additionally, facilitators and co-facilitators met after the first focus group to discuss tentative findings and areas for further exploration before the second focus group session [24]. This ongoing data collection and analysis enabled the researchers to adapt interview questions as findings emerged.

In the present study, we engaged with the data for a prolonged period to ensure a comprehensive understanding of the data prior to analysis. In addition, we examined different data sources, including transcripts from audio-recorded focus group sessions, field notes, and descriptive summaries from co-facilitators. Further, discussing the preliminary results among the researchers helped refine our insights into a more in-depth analysis considering multiple perspectives. The above strategies helped ensure that findings are trustworthy and based on the data.

2.6. Ethics

Administrative approval from the Medical College of Wisconsin's Institutional Review Board was obtained before the primary study was conducted, and verbal informed consent was obtained from participants before enrollment. Participants were made aware of the risks of participating in this study, including the threat to privacy and confidentiality. They were also informed of their right not to participate or

withdraw consent at any stage of the study. Identifying information was not included in the data to protect participants' confidentiality.

3. Results

This study included 16 participants, ages 30–77. Six of the participants had lived with type 2 diabetes for 5 years, while 10 had lived with it between 10 and 20 years. Based on the analytic process, we identified four themes that characterized family influences on different aspects of diabetes self-management, including diet, exercise, stress, and self-care routines, for African American adults with type 2 diabetes who reported food insecurity. The themes (see Table 1 below) include Changes in Diet and Exercise Routines, Family Assistance with Diabetes Self-Management, Conflict between Self-Care and Family Responsibilities, and Adapting to Family Situations.

3.1. Change in diet and exercise routines

This theme describes how living with family members affects participants' diet and exercise management. Subthemes include the following:

3.2. Stress of cooking separate meals

Participants talked about how hard it was to adhere to dietary guidelines when living with family members. Even though they had the correct information on the dietary management of diabetes, the family became a ready excuse for not adhering to dietary guidelines. As one participant explained, *"I know what I should be eating. I have a granddaughter in my care, so sometimes, I use that as an excuse."* Participants expressed that avoiding difficult choices involved with dietary management seems easier than going through the stress of cooking separate meals. For others, the thought of cooking separate meals for themselves and their family discouraged them from trying.

3.3. Cost of cooking separate meals

Participants pointed out the cost, effort, and time it would take to make separate meals to accommodate their dietary requirements. One participant explained,

I know things that I should eat more of-fish, that's a little more expensive than a pound of hamburger, I think fish is at least \$5 a pound anytime you try to find any cod or something. And I do try to stock up on it. But I'm not always able to do that. Like I said, I have a 15-year -old granddaughter with me and I do not want to be cooking two meals..... It is just a lot of running around, and it is time-consuming, but it's not that I can't do it, I don't really know if I have access to it. If I watch my other groceries or expenses, I could afford to eat those things.

Table 1
Themes and subthemes.

#	Themes	Sub-themes
Theme 1	Change in Diet and Exercise Routines	Stress of cooking separate meals Cost of cooking separate meals I. Difficulty abstaining from sweets when living with grandkids. II. Obstruction in exercise routines
Theme 2	Family Assistance with Diabetes Self-Management	I. Reminders from family II. Partnering with family on self-care tasks
Theme 3	Conflict Between Self-Care and Family Responsibilities	I. Childcare and stress II. Competing priorities and family responsibilities
Theme 4	Adapting to Family situations	I. Accepting family living situations II. Overcoming family living situation

3.4. Difficulty abstaining from sweets when living with grandkids

Participants also talked about how difficult it is to keep their diet in check when they live with grandkids. Participants explained that grandkids desired foods/snacks that are considered unhealthy for people with diabetes. Having those kinds of food in the house can be tempting, as highlighted by one participant, *"I spend much time with my grandkids, and sometimes I get them treats and other kinds of sweets...I partake in those treats; I cannot give them up, neither the children nor the candy nor the treat."*

3.5. Disruption of exercise routine

Beyond meals, family influence extended to other aspects of diabetes management, like exercise. One of the participants mentioned how unsafe their neighborhood is for exercising outdoors and the difficulty with maintaining an indoor routine of exercising when there are many people in the same house, as highlighted. *"I used to exercise with TV. I got a tape and everything, but it is impossible to do that now. Everybody is sleeping everywhere, so I do not get as much exercise as I would like to."*

4. Family assistance with diabetes self-management

Despite the difficulty in maintaining diabetes self-management as described above, participants also described some positive effects their families have on their diabetes management. This theme describes how families support participants in diabetes management. Sub-themes include the following:

4.1. Reminders from family members

Participants talked about how their families help keep them in check when they drift away from the recommended lifestyles. *"My grandkid tells me, 'Grandma, I know you are not supposed to be eating that kind of thing.'" Participants believe that reminders from family members regarding their lifestyle choices are helpful because they keep them from deviating too far from their diabetes self-care.*

4.2. Partnering with family on self-management tasks

Another participant shared how she leverages her time with her grandkids to complete her exercise goal, like walking together. As the participant puts it, *"I go out to the lake and do a long stretch walking with my grandkids."* suggesting that having someone to partner with for exercise bolsters motivation.

5. Conflict between self-care and family responsibilities

Living with family also comes with added responsibilities that constitute stress and affect self-management. This theme describes the additional roles that participants assume while living with family members and how it affects their diabetes self-care. Sub-themes include the following:

5.1. Childcare and stress

Participants described how stressful it can be when many family members live under one roof with grandkids. Children are active, and the additional responsibility of watching grandchildren or caring for other family members can create stress that negatively affects blood sugar as highlighted below:

I noticed that my sugar is much higher than it was when I am calm, and that is because my daughter and her kids moved back home for a little while. She has five kids, and we are all in a one-bedroom apartment, so that keeps me jumping.

5.2. Competing Priorities and Family Responsibilities

In addition to the stress associated with an overcrowded home and the added responsibility of caring for grandkids, participants sometimes neglect their self-care. The added burden of caring for others can interfere with attending medical appointments, as exemplified below.

“When you got a large family as I do... I am the mother of 9 with 18 grandkids. Go here, go there. So, I put off doctor appointments when I know I am supposed to do it.”

Missing medical appointments can be dangerous, especially for older adults with comorbidities. Some participants learn to live with the above challenges daily and hope things change or find other ways to cope.

6. Adapting to family living situations

This theme explains how individuals navigate and respond to challenges within their family environment. Sub-themes include the following:

6.1. Accepting family living situations

Some participants believe that living alone without the inconvenience of sharing space with other family members would help their dietary management and exercise.

Right now, it is like how you cook for them, and everybody wants this, then the other. It's just so congested right now, so I grab what I can. I don't know that they would move out, (but if they did) maybe I can get back to the routine exercise regularly, and I could eat better.

6.2. Overcoming family living situations

While some participants expressed their hope for things to change for the better, others talked about the need to take control of their lives and rise above their family situations. The quote below by a participant exemplifies how some participants overcome the challenge of juggling family responsibilities with their diabetes self-management by learning to put themselves first:

By me missing appointments, it is not healthy or good for me. So, I started just doing things for myself. As my kids say, I started doing ‘me.’ Keeping up with all my doctor's appointments, taking my medicine on time, and trying to stay ahead of this diabetes before it causes more damage, that is what I have been doing.

For these participants, prioritizing self-care while living with their animal was essential to preserving their health.

7. Discussion

Among these African Americans with food insecurity, we found that living with their family affected vital aspects of their diabetes self management, including diet, physical activity, stress, and attending regular healthcare appointments. Living with family members led to overcrowded housing, created challenges, and added extra responsibilities for the family member with diabetes. For many, this disrupted their self-care routines and ability to manage diabetes effectively. However, families also provided some support for diabetes self management. Participants had to adapt to the impact of the family on their diabetes self-management or prioritize self-care over family obligations.

This study adds to the existing literature by providing a detailed assessment of how African Americans with type 2 diabetes manage family responsibilities within the context of food insecurity. We found that for this population of African American adults with food insecurity, families affected different aspects of their diabetes management, including diet, exercise, and stress management. Prior studies on family influences in diabetes management focus on specific behaviors that support or hinder self-care. This study stands out by exploring how

living with family members affects the overall experience of diabetes self-management among African American adults in the context of food insecurity. Similar to findings from this study, prior studies have found that families can support or hinder diabetes self-management [18,22,29]. In a meta-synthesis that analyzed 40 qualitative studies that described family behaviors that impact diabetes self-management, Vongam and colleagues described positive care partnerships in which family members participated in dietary planning, such as shopping and cooking healthy meals, as well as partnering with them for exercise [16]. On the other hand, family members have been found to disrupt patients' attempts at self-management through obstructive behaviors such as nagging and not being considerate of their dietary restrictions [16,17,22,29]. While our participants did not report nagging or voluntarily withdrawing support for participants, families inadvertently impacted participants' diabetes management negatively when their children and grandkids moved in with them, creating overcrowded homes that added stress, in addition to disrupting their exercise and dietary management.

Dietary management is a crucial aspect of diabetes management and is especially difficult when patients live with other family members. In our study, participants complained of the cost and stress of cooking separate meals. The cost, time, and effort involved in cooking separate meals outweighed their health benefits for some participants. In addition, participants often prioritized the preferences of other family members rather than adhering to dietary guidelines. Similarly, Oftedal [29] reported that persons with diabetes in their study ate whatever was available in the home to accommodate others and then resorted to increasing their insulin. While other studies report that family members often sabotage diabetes self-management [16,17,22,29], participants in our study self-sabotaged their diabetes self-management by bringing unhealthy food items into the house, albeit for their grandkids.

Participants in this study reported that families sometimes help to keep them in check by reminding them when they are deviating from their dietary recommendations, and that their grandchildren were available and willing to join them on their walks. However, other participants in our study reported difficulty maintaining indoor exercises in overcrowded homes. The inability to engage in indoor exercises has significant consequences, given that indoor exercises might be the most feasible option for individuals living in unsafe neighborhoods that lack convenient walking places. Exercise is one of the seven essential self-care behaviors required for adequate management [30] and is associated with reduced risk of diabetes-related micro and macrovascular complications [31]. Similar to this study, previous research reports that family members support diabetes self-management by partnering with the members with diabetes for exercise, providing assistance with meal planning, and other instrumental support [16,17]. Such support is positively associated with improved diabetes self-care [14,32].

Stress is associated with poor glycemic control [33]. As expressed by participants in this study, living with many people adds an extra layer of stress attributed to overcrowding, disruption of self-care routines, and childcare responsibilities. Consequently, some participants reported missing medical appointments due to competing demands on their time and attention. Poor dietary management, inability to carry out either indoor or outdoor exercises due to overcrowded homes or unsafe neighborhoods, stress, and missed appointments due to competing needs could negatively impact glycemic control and, hence, diabetes outcomes.

Further, we found that despite negative family influences on their diabetes self-management, some participants felt helpless and unable to change the status quo and, instead, hoped things would change. Others reported that they learned to prioritize their self-care over family responsibilities. This act of prioritizing one's self-care has also been reported in a previous study by Vongam and colleagues, who found that individuals who felt overwhelmed by family obligations or viewed family behavior as a hindrance to managing their diabetes often opted to prioritize their health over such family responsibilities [16]. In our study, even though individuals were interdependent in many regards

while living with their families, they strived for independence in terms of their diabetes self-management by learning to prioritize themselves. Based on these results, interventions aimed at improving diabetes outcomes for food-insecure African American adults with type 2 diabetes should incorporate strategies to help individuals prioritize their health within the context of family responsibilities.

7.1. Limitations

This study involved a secondary analysis of data collected for a prior study focused on broader challenges of diabetes care for food-insecure African Americans with T2D. Therefore, it may not have captured the depth of experiences regarding family influences on diabetes self-management, as specific questions did not probe this particular aspect of daily life. Future studies are needed to explore additional ways in which the family influences self-management for individuals with food insecurity. In addition, the small sample size may limit the generalization of the findings. However, the focus group discussion approach to data collection allowed an in-depth exploration of family influences on diabetes self-management in an understudied and at-risk population.

8. Conclusion

Our findings from food-insecure African Americans with type 2 diabetes reveal that families significantly influence diabetes self-management, confirming similar outcomes from research with other populations. Given their distinct sociocultural and economic characteristics, there is a clear need for family-inclusive diabetes self-management education and support explicitly tailored for African American adults living with diabetes while experiencing food insecurity. Such diabetes self-management education sessions should target prioritizing one's health despite family responsibilities and allow for problem-solving around challenges and facilitators of self-care behaviors within the context of the family living situation.

CRedit authorship contribution statement

Rebekah J. Walker: Writing – review & editing, Visualization, Supervision, Funding acquisition, Data curation. **Sandra Iregbu:** Writing – original draft, Visualization, Methodology, Formal analysis, Conceptualization. **Egede Leonard:** Writing – review & editing, Visualization, Supervision, Methodology, Funding acquisition, Data curation, Conceptualization.

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Declaration of Competing Interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests. Leonard Egede reports financial support was provided by National Institute of Diabetes and Digestive and Kidney Diseases. Leonard Egede reports financial support was provided by National Institute on Minority Health and Health Disparities. Rebekah Walker reports was provided by National Institute on Minority Health and Health Disparities. If there are other authors, they declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data may be available from the corresponding author, LEE, upon reasonable request.

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