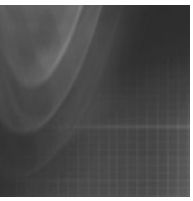
Health-Illness Transition Experiences With Type 2 Diabetes Self-management of Sub-Saharan African Immigrants in the United States



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Purpose

The purpose of this study was to describe Sub-Saharan African immigrants' health-illness transition experiences associated with type 2 diabetes mellitus (T2DM) self-management.

Methods

A qualitative description methodology was used in this study. Face-to-face semi-structured in-depth interviews lasting 60 to 90 minutes were conducted with 10 Sub-Saharan African immigrant men and women with T2DM recruited using purposive and snowball sampling. Each interview was audio-taped, transcribed, and analyzed using qualitative content analysis.

Results

Participants' mean age was 60.3 years (range, 44-76 years), 5 men and 5 women; most had lived in the US for more than 10 years (70%) and with T2DM for more than 5 years (60%). Four overarching domains described the health-illness transition experiences the participants had with T2DM self-management: (1) knowledge of T2DM self-management behaviors, (2) current T2DM self-management behaviors, (3) inhibitors of T2DM self-management, and (4) facilitators of T2DM self-management.

Conclusions

Health professionals should be equipped with an understanding of the properties and conditions of health-illness transition. This understanding is necessary to build a foundation that facilitates healthy adaptation to the T2DM transition requiring the development and mastery of new skills consistent with gaining control of T2DM. Culturally tailored interventions need to be developed to decrease inhibitors of and encourage self-management in daily T2DM care for Sub-Saharan African immigrants with T2DM.

Immigrants experience changes in health status during their adaptation to the new environment and culture.[1] The high levels of type 2 diabetes mellitus (T2DM) among immigrants may be linked to lifestyle changes following migration[2] as well as psychological stress, loss of social networks, and harsh social conditions in the new environment.[3-9] Health-illness transition challenges experienced among Mexican immigrant women in the US-Mexico border region diagnosed with T2DM included limited to no English language, low level of education, limited diabetes self-management knowledge, and low diabetes self-efficacy.[10] A study conducted with Chinese immigrants diagnosed with T2DM discovered a difference in diabetes self-management behaviors between older and younger immigrants. For example, older Chinese immigrants were more likely to engage in self-management behaviors of dietary modification, exercise, and foot care than younger Chinese immigrants. Additionally, depression was higher among Chinese females than males.[11] Multiple factors including stigma about diabetes and uncontrolled diabetes related to language and cultural barriers delayed the health illness transitions of first-generation Korean American immigrants.[12] Diabetes health-illness transitions are complex for immigrants, and diabetes educators are challenged to construct culturally, developmentally, and gender-tailored interventions to facilitate diabetes health-illness transitions.

T2DM is a major and increasing health problem in the US Sub-Saharan African immigrant population that calls for interventions to facilitate their health-illness transitions for achieving successful diabetes self-management. The Sub-Saharan African immigrant population in the US increased from 130 000 in 1980 to 1.5 million in 2010.[13] In 2013, the largest number of Sub-Saharan African immigrants came from 6 countries: Nigeria (234 500 immigrants), Ethiopia (195 800), Ghana (149 400), Kenya (110 700), South Africa (95 200), and Liberia (78 900).[14,15] An estimated 8257 Sub-Saharan African immigrants live in the Greater Sacramento region, a northern California region (comprised of 6 counties). Of those, 5074 live in Sacramento County.[14]

For Sub-Saharan African immigrants in the Greater Sacramento region and the US in general, little to no data are available on T2DM management[16] and health care access and utilization.[17,18] T2DM data about Sub-Saharan African immigrants are interspersed among Black or African American individuals. However, available studies indicate that T2DM is a growing problem among Sub-Saharan African immigrant populations in the US.[19-27] Additionally, Sub-Saharan African immigrant patients with T2DM often have poor glycemic control.[27] Sub-Saharan African immigrants are the least studied racial subgroup.[28] The purpose of this study was to describe Sub-Saharan African immigrants' health-illness transition experiences associated with T2DM self-management.

Research Questions

The research questions for this study were:

Research Question 1: What is the knowledge of T2DM self-management behaviors among Sub-Saharan African immigrants who are diagnosed with T2DM?

Research Question 2: How are Sub-Saharan African immigrants who are diagnosed with T2DM currently managing T2DM?

Research Question 3: What are the inhibitors and facilitators of T2DM self-management experienced by Sub-Saharan African immigrants diagnosed with T2DM?

T2DM Self-management Health-Illness Transition Among Sub-Saharan African Immigrants

The middle range nursing theory of transitions[29] provided the framework to describe the experience of individuals who are confronting, living with, or coping with a situation requiring the development and mastery of new skills.[30] Transitions represent periods during which individuals make the shift from one life phase, situation, or

status to another[31] as well as periods of vulnerability to risks inherent in health or health-illness.[19,32] There are 4 types of transitions: developmental, situational, organizational, and health-illness[33]; this study focuses on health-illness transition experiences associated with T2DM self-management.

The model of middle range theory of transitions (Figure 1) consists of 3 general dimensions of transitions: nature of transitions, transition conditions, and patterns of responses. The nature of transitions includes the types, patterns, and properties of transitions. Transition conditions play an important role in mediating between transition properties and the indicators of healthy transition and include personal, community, and/or societal factors that could facilitate or inhibit the diabetes health-illness transition. Patterns of responses to the transition include process and outcome indicators. Nursing or community health worker therapeutics interconnects all 3 dimensions of the transition model and consists of interventions that can occur at each of the 3 dimensions within the transition process.[29] These interventions can facilitate or diminish inhibitors affecting the transition outcome to promote healthy responses to transition at many points during the health-illness transition process.

Methods

This researcher used a qualitative description methodology to provide a rich description of participants' experiences. According to Sandelowski,[34] qualitative description is the best choice for obtaining straightforward descriptions of phenomena and straightforward and minimally theorized answers to questions of special relevance to practitioners and policymakers.[34-36] Qualitative description is least encumbered by preexisting theoretical and philosophical commitments.[34] Thus, despite drawing from the theory of transitions to focus on a type of transition—health-illness—and informing research questions related to facilitators and barriers of the diabetes health-illness transition, the researcher remained close to the data and the participants' actual words and events during data analysis. The domains represent a summary of the contents of the data that respond to each of the research questions and may therefore be interpreted as an a priori set of codes applied to the data. However, consistent with the tenets of qualitative description methodology, the researcher was reflexive and iterative, remaining open to codes for producing a descriptive summary of the diabetes health-illness transition experiences of Sub-Saharan African immigrants and to answer questions of relevance to practitioners who care for individuals diagnosed with T2DM.[34]

Sample and Setting

The University of Arizona Institutional Review Board (IRB) approved the study. The primary investigator (PI) posted recruitment flyers at 4 Sub-Saharan African immigrant churches in Sacramento County. Ten adults with T2DM were recruited from April to June 2016 using purposive and snowball sampling methods. Inclusion criteria were: (1) 21 years of age or older, (2) self-identified as Sub-Saharan African immigrants and born in Sub-Saharan Africa, (3) lived in Sub-Saharan Africa for at least 18 years and in the Greater Sacramento region for at least 1 year, (4) self-reported diagnosis of T2DM for at least 1 year, (5) able to communicate in English, (6) able to reflect on their transitional experiences related to T2DM self-management and answer the interview questions, and (7) agreed to participate in one 60- to 90-minute, in-person, and audio-recorded interview.

Data Collection

The PI administered the demographic and transition experience questionnaire to each participant at the beginning of each data collection session, followed by the in-person semi-structured interview. The transition experience questionnaire asked about medical history information and included year and place of diagnosis, experience with first US health care provider on providing information on diabetes self-management, diabetes care in the US, places of diabetes care in the US, support and resources used for managing diabetes, and family history of diabetes. The PI used probes to encourage expansion of ideas deemed most relevant to interview questions. At the end of each interview, the PI summarized the participants' words in order for participants to determine whether they represented their point of view. The homogeneity of the sample, shared cultural beliefs and values, and migration and resettlement experiences, contributed to data saturation with a sample size of 10 Sub-Saharan African immigrants with T2DM. Each participant received a $25 gift card acknowledging their participation.

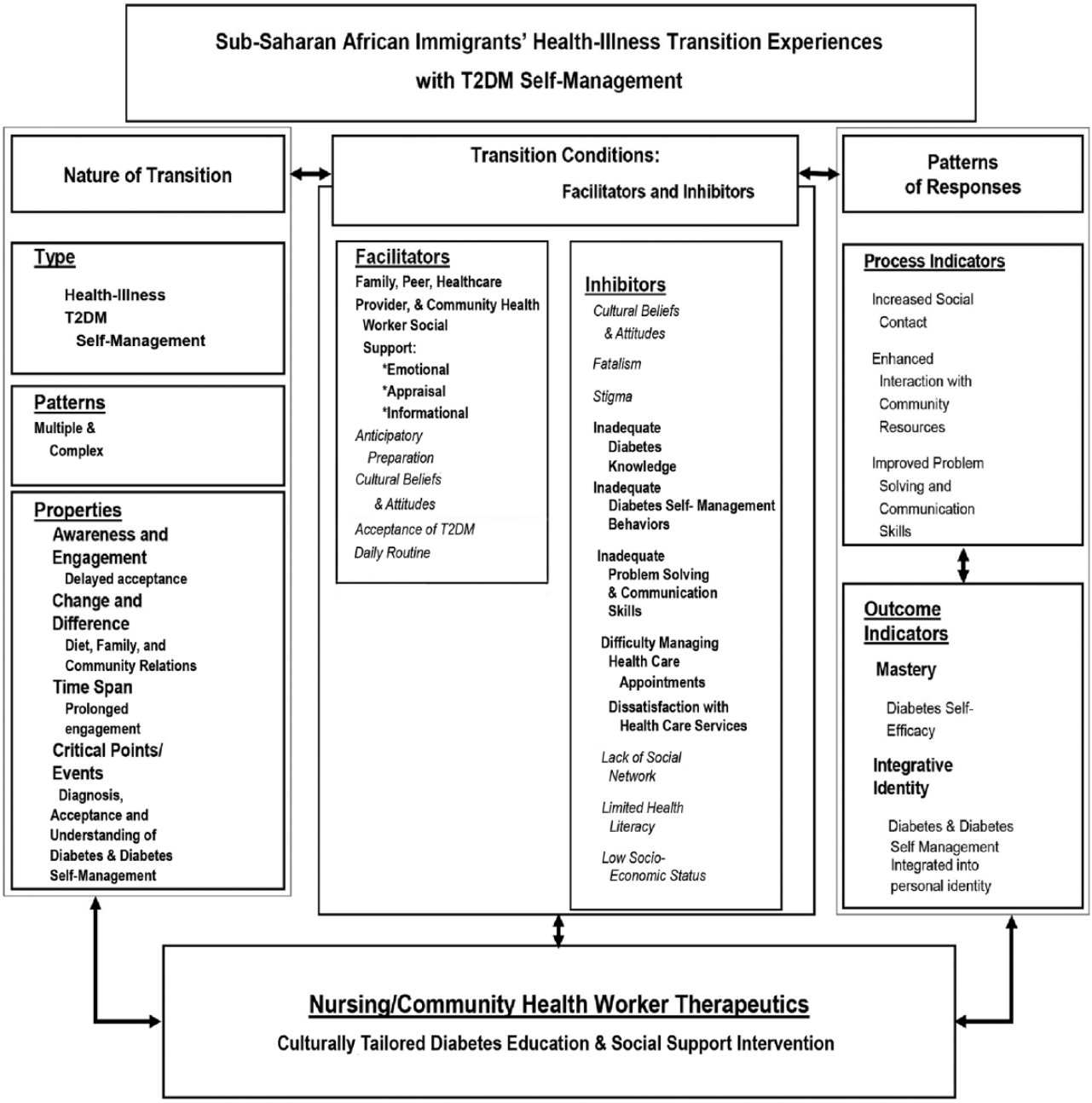

Figure 1. Diabetes self-management transition experiences among Sub-Saharan African immigrants with type 2 diabetes mellitus. Adapted with permission from Meleis et al.[29]

Data Analysis

Data were analyzed using qualitative content analysis.[34] The PI transcribed each of the interview recordings into Microsoft Word documents, then conducted the initial analysis using an interactive and reflexive process, which included several steps: (1) read each interview transcript multiple times to enhance familiarity with data; (2) conducted analytical development and deductive, open coding of data, noting words, phrases, patterns, and relationships in the data; (3) selected domains in response to research questions, remaining open to codes that were

outside the research question domains; (4) condensed the meaning units described by words or phrases and coded them with a label that closely reflected the participant's language[37]; (5) categorized similar codes, remaining close to the original context[37]; (6) separated codes into smaller units or subcategories; (7) performed an interpretive cross-contrasting of subcategories and categories[37]; (8) interpreted and merged subcategories and categories into domains[38]; and (9) selected participant quotes to support the domains.[34] An audit trail was conducted by a qualitative researcher who read each of the interview transcripts, analyzed the data by developing codes, and compared her analysis to the researcher's codes. The consensus of the data analysis process included identification of robust data bits, linkage to subcategories, and abstraction to identify categories and domains.

Characteristics of the Sample

The sample consisted of 5 male and 5 female participants, who were native to 7 Sub-Saharan African countries. Participants' overall mean age was 60.3 years. Seventy percent reported some or full completion of university and had lived in the US for more than 10 years. Sixty percent reported full-time employment. Five full-time employed participants and 1 who worked part-time had employer-sponsored health insurances. One participant who worked full-time, 2 who were retired, and 1 who was unemployed had Medi-Cal, California's Medicaid health care program. Sixty percent reported a family history of T2DM, were married, and had lived with T2DM for more than 5 years. Thirty percent were diagnosed with T2DM less than a year after their arrival in the US. Ninety percent of participants were taking oral hypoglycemic agents (Table 1).

Results

This section summarizes the 4 overarching domains, categories, and subcategories (see Figure 2). These findings are supported with examples of brief quotes from the participants.

Domain 1: Knowledge of T2DM Self-Management Behaviors

This domain was supported by 3 categories: (1) knowledge of diabetes, (2) diabetes is caused by, and (3) diabetes affecting my body. Category 1, knowledge of diabetes, emerged from 2 subcategories: defining diabetes and dangerous disease.

Defining diabetes

To explain diabetes, 4 participants provided biomedical explanations of diabetes that they had acquired through extensive reading. Participant (P) 3 explained, "Diabetes is a disease whereby your body is not able to give you enough insulin to cover the glucose or the sugar that's in there that came from food and other sources."

Dangerous disease

Three participants mentioned that diabetes was a dangerous disease. For example, "I can say the worst and very dangerous disease. And it [diabetes] is complicated too" (P5).

Category 2, diabetes is caused by, emerged from the subcategories (1) issues with insulin; (2) genetics/heredity, age, race, and lifestyle; (3) US foods; and (4) stress.

Issues with insulin

Three participants mentioned issues of the body not producing enough insulin, insulin resistance, or becoming not sensitive to insulin. For example, "Type 2 diabetes is a situation whereby your body is not able to make use of the insulin or your body is not sensitive to insulin" (P1).

Genetics, heredity, age, race, and lifestyle

Participants mentioned heredity or genetics combined with environmental risk factors as causes for T2DM. For example, "Sometimes you're just exposed genetically. If your parents or your grandparents already have diabetes, you're already at risk" (P3).

US foods

Participants mentioned negative effects of American foods and beverages on T2DM, suggesting replacing North American foods with the home country foods and regular sodas with diet sodas to manage the disease. For example,

> The food we eat and the drinks we drink here in the United States cause diabetes because when I was in Africa I didn't have diabetes. . . . I went home in Africa

Table 1

Participants' Characteristics (N = 10)

Characteristics	No.	Percentages	Characteristics	No.	Percentages (%)
Age range, 44-76 y Mean: 60.3 y SD: 9.71 y			No. y in the US		
			<10	3	30
			10-20	4	40
			21-30	2	20
			>30	1	10
Gender			Years with diabetes		
Male	5	50	<5	4	40
Female	5	50	5-10	4	40
			11-15	1	10
			>15	1	10
Country of birth			Relative(s) with diabetes	6	60
Eritrea	1	10			
Ethiopia	1	10			
Kenya	2	20			
Liberia	1	10			
Nigeria	2	20			
Sierra Leone	1	10			
Zimbabwe	2	20			
Employment status			Treatment		
Full-time	6	60	Oral hypoglycemic agents	9	90
Part-time	1	10	Insulin	1	10
Retired	2	20			
Unemployed	1	10			
Education level			Health insurance status		
Primary (elementary)	1	10	Medi-Cal (California's Medicaid)	4	40
Secondary	2	20	Employer-sponsored health insurance	6	60
University/tertiary	7	70			
Marital status			Place of diagnosis		
Married	6	60	Emergency room	2	20
Divorced	2	20	Health care provider's office (clinic)	8	8
Single	1	10			
Widowed	1	10			

. . . and I forgot my medications here [US]. . . . I was checking my sugar every day. It was really low. It was normal. (P2)

If I was home [Sub-Saharan Africa], probably at my age, I would not have diabetes. . . . I'll say my diet is made from cornmeal . . . I grew up eating the same

Domains	Categories	Sub-categories
Knowledge of T2DM Self- Management Behaviors	Knowledge of Diabetes	Defining Diabetes
		Dangerous Disease
	Diabetes Is Caused By	Issues With Insulin
		Genetics, Heredity, Age, Race, & Lifestyle
		U.S. Foods
		Stress
	T2DM Affecting My Body	Symptoms of T2DM
		Complications
		Consequences of Poor T2DM Management
Current T2DM Self-Management Behaviors	Taking Control	Managing my diabetes
		Recognizing Body Cues
Inhibitors of T2DM Self- Management	Cultural Beliefs, Attitudes and Influences	We only see the doctor when we are sick
		Social gatherings
		Social stigma
	Way of Life in U.S. Different than Africa	Lack of Time: Diet and exercise
		No more walking
	Diet Struggles	Change in African diet
		Absence of indigenous foods
	Limited Diabetes Literacy	No understanding of diabetes
		Information is too scientific
	Low Social Economic Status (SES)	No insurance / income gaps
		Cost of healthy foods and medications
Facilitators of T2DM Self- Management	Routine	Finding it easier
		Making it a habit
	Social Support	Family support / peer support
		Provider-patient relationship
		Spirituality
		Resources used to support T2DM self-management behaviors

Figure 2. Domains, categories, and subcategories.

> cornmeal. I never had problems with the diabetes or weight . . . [thus] the food we eat [in the US] causes diabetes. (P3)

Stress

Participants perceived that stress could be the underlying cause of T2DM among Sub-Saharan African immigrants. They assumed that T2DM could be cured by treating stress. For example:

> I can say that 90% of the people, my home people who came from Africa, they never have diabetes when they were in my country but when they come here [US], they have it. So I think the lifestyle, the competition, the rent, everything affects their life. Sometimes even if you are working, sometimes you cannot afford to pay the rent. It is expensive. So it adds up to the stress . . . then stress is another cause. (P5)

Category 3, T2DM affecting my body, emerged from 3 subcategories: (1) symptoms of T2DM, (2) complications, and (3) consequences of poor T2DM management.

Symptoms of T2DM

Commonly reported symptoms of T2DM included frequent urination, thirst, intense hunger, tiredness, vision changes, headache, and dry mouth. Experiencing symptoms of diabetes helped to detect and treat diabetes early. However, P5 reported not experiencing symptoms of diabetes prior to his diagnosis: "I never get sick. I never have any sign of diabetic [prior to my diagnosis]. So

sometimes you see the sign then you can suspect and take care of it early, sometimes it doesn't show any signs."

Complications

In response to the question, "What are the complications one is likely to get if he or she is not treated on time?," P1 stated,

> You may be losing that [your eyes] . . . because of the spoilage of the nerve endings in your eye. . . . Your extremities may start feeling some sensation, losing a sensation because of your nerve endings getting affected by the sugar that you have. Sometimes may be in very extreme cases a person may develop sores or wounds that are due to diabetes.

Consequences of poor T2DM management

Two participants stressed the importance of managing T2DM correctly for preventing diabetic complications. For example, "If you don't end up managing correctly, that's what happens. You end up losing your kidneys, or you lose your feet" (P4). Four other participants explained how diabetic complications may occur, "[People end up with diabetes complications because] they do not take care of their body" (P7).

Domain 2, Current T2DM Self-Management Behaviors

This domain was supported by 1 main category, taking control, which emerged from 2 subcategories: (1) managing my diabetes and (2) recognizing body cues.

Managing my diabetes

Participants elaborated on the importance of medications, blood glucose monitoring, diet, and exercise. For example,

> I know when I get up in the morning . . . one of the first things I do is check my sugar and take my pills. . . . I know if I don't take my pills, [or] If I don't check my sugar, I'll be in danger. . . . So it's just like something you don't forget. (P2)

> I have to eat good [or healthy] food . . . [because] eating good [healthy] food is also the number one thing I use to care of my diabetic . . . carbohydrates and I don't eat too much . . . [and] . . . I always make sure I get my exercise. That is the number one thing I don't forget because it is very important to me. (P6)

Recognizing body cues

Some participants did not monitor their blood glucose before meals, preferring to use body cues in interpreting their blood glucose levels. For example, "I do not check my blood sugar every day. I check it 3 or 4 times a week. I studied my system to the point that I never go to the low blood sugar" (P7).

Domain 3, Inhibitors of T2DM Self-Management

This domain was supported by 5 categories: (1) cultural beliefs, attitudes, and influences; (2) way of life in US different than Africa; (3) diet struggles; (4) low social economic status (SES); and (5) limited diabetes literacy.

Cultural beliefs, attitudes and influences

Three subcategories emerged: (1) we only see the doctor when we are sick, (2) social gatherings, and (3) social stigma. The participants described perception of the US culture and compared it with the Sub-Saharan African culture.

We only see the doctor when we are sick. This subcategory refers to a behavior of seeking health care for symptoms. Participants reported that Sub-Saharan African immigrant communities do not believe in taking good care of their health. Their comments were:

> In Africa, when it comes to diseases we always think it comes from witchcraft. . . . The only thing when you get up in the morning you feel good, that's it . . . we go see the doctor or go to the hospital only when we're sick. There is no physical check-ups. (P4)

> That is the most to people from Africa I can say that is the most number one problem. They don't go to a doctor. Even though they have Medicaid insurance they don't use it unless they get sick. They don't go for check-up most of the time. (P5)

Social gatherings. Cultural barriers toward disclosing a diagnosis of T2DM to persons outside family are evident at social gatherings, owing to fear of others' misunderstanding of T2DM management requirements, especially related to healthy eating. Special occasions are accompanied by the preparation and consumption of high-calorie party foods, such as rice, pasta, and *injera*,

which inhibit adherence to healthy eating and diet, both essential for effectively managing diabetes. For example,

> There are times when there is a party or gathering. . . . In my community or people from my country we get together a lot. It's hard because you get together with people you know around food. You say ok it's a gathering so I can eat more. You don't get anybody discouraging you. . . . The women I know, the older women in our community, they have diabetes. Nobody is educating others. Saying hey, watch what you're eating . . . so it makes it very hard when you're gathering around the food to be able to manage your diabetes. (P3)

Social stigma. Participants indicated that T2DM was a social stigma in their communities and many individuals with T2DM tried to hide their diabetes. For example, "It is a cultural issue. They [Sub-Saharan African immigrants] don't want to discuss their health issues with you. . . . To them it is taboo to discuss their business. They have the secretive mentality" (P7).

Way of life in US different than Africa

The 2 subcategories that emerged included: (1) lack of time: diet and exercise and (2) no more walking.

Lack of time: Diet and exercise. Participants confided that lack of time interfered with monitoring blood glucose, following a healthy eating plan while at work or school, and participation in physical activity. For example, "You don't have a lot of time to take care of yourself. It's easy just to eat the things that are already made . . . not in the house, but out there. So, you're not really watching what you're eating" (P3).

No more walking. Participants mentioned walking less in the US than in Sub-Saharan Africa. For example, "If you think about it people gain weight once they're here because you don't do a lot of walking like back home [Sub-Saharan Africa]. Back home they do a lot of walking. Not everybody has a car" (P3).

Diet struggles

Through further analysis of the data, 2 subcategories emerged: (1) change in African diet and (2) absence of indigenous foods.

Change in African diet. While most participants associated a healthy diet with T2DM self-management, some struggled with adjusting to not eating favorite foods, craving high-carbohydrate foods, or adjusting to dietary recommendations. For example: "In our culture, . . . you eat all sorts of things, but if you don't eat rice, you don't feel satisfied" (P4).

> I'm sorry I can't eat salad every day. I can't take soups all the time. . . . So I tell my nutritionist over and over that it is useless for her to give me these lists of foods because I am not going to use them. . . . I would rather stick to what I know. (P7)

> "They told me don't eat rice. . . . If you have diabetes, you don't eat fufu everyday. But it is your diet. Fufu is your diet. Rice is your diet . . . there is no African man who will not eat rice, will not eat fufu. (P10)

Absence of indigenous foods. Participants expressed the feelings of loss and struggles over reducing or cutting staple native foods. For example,

> It's mostly the lack of accessibility to the food [cornmeal] we are used to eating which makes it hard. . . . We can't just change. If somebody changes from what they were eating when they were younger, what they grew up eating, all their life to just not find it anymore or just stay away from cornmeal all together. That's what we know . . . it [cornmeal]'s a staple of the diet that we can't live without. That's what we eat. (P3)

Limited diabetes literacy

Two subcategories emerged: (1) no understanding of diabetes and (2) information is too scientific. Some participants not only lacked understanding of their T2DM but also perceived poor quality of diabetes care information. These were some of the main inhibitors of T2DM self-management: "It [diabetes] is not a good sickness at all and how you get it, I have no idea" (P2). "I don't know really the cause [of diabetes] . . . maybe sugar" (P9). "I think that some information may be too scientific to people, but it can be simplified before it's given to people" (P1). "He [my doctor] gave me booklets about diabetes to read . . . I don't think I can understand them" (P2).

Low SES

The subcategories were: (1) no insurance/income gaps and (2) cost of healthy foods and medications, both of which increased patients' difficulty receiving medical care or following a T2DM-appropriate diet. For example,

"Drugs are also expensive . . . I found out when I lost my insurance, how much the drugs cost" (P4).

> Well, when you go to the stores you see that the healthy and good food is very expensive that only rich people could have. But the poor people go mostly to fast food. That is the only thing they can afford. (P5)

"You have to take medication to make the diabetes better but you don't have no money" (P10).

Domain 4, Facilitators of T2DM Self-Management

This domain was supported by 2 categories: (1) routine and (2) social support. These 2 categories were supported by multiple subcategories, including familiarity and habits associated with T2DM self-management and social support, spirituality, and resources.

Routine

Two subcategories were: (1) finding it easier and (2) making it a habit. Participants regarded having a daily routine or schedule to be an important facilitator to blood glucose monitoring and medication adherence. For example, "It's easier because now I'm used to it [T2DM and T2DM self-management]. It's like my everyday living" (P4). Blood glucose monitoring, taking medications, healthy eating plan, and keeping provider's appointments became habits. For example, on checking blood sugar and taking medication, one participant stated: "It is just become something natural which I always do. . . . It's a schedule. I don't forget. It's my life" (P2).

Social support

Four subcategories were generated: (1) family support/peer support, (2) provider-patient relationship, (3) spirituality, and (4) resources used to support T2DM self-management behaviors. Family members were a primary source of support, emotional support was provided in the provider-patient relationship, and spirituality and informational and appraisal support were provided through a variety of resources. The provider was also noted as offering appraisal social support.

Family support/peer support. The most frequently mentioned source of emotional and instrumental support was family members, particularly spouses, children, and parents who provided reminders to take medications, comfort, encouragement, surveillance, and transportation to medical appointments and grocery stores and assisted with meal preparation:

> My husband is always reminding me to take my pills. . . . Also, when there is a gathering. I want to eat small piece of cake, . . . my mom will say something like no, no, no you need to stop. Don't eat that. (P3)

"I'm glad my wife is cooking. She takes the time to fix my food first, before she fixes the family food" (P4).

Participants mentioned that they also received peer support in diabetes-related care, such as sharing stories and ways to manage and cope with diabetes:

> I don't have too many people, only a few people from my country. They help me. It helps when we are together I can discuss about the diabetes. Most of us have diabetes from Africa. . . . We all share our diabetes stories. All those things. They help a lot. (P2)

Provider-patient relationship. Participants considered the provider-patient relationship as a source of emotional support. For example, "I would say the way I learned to manage my diabetes is through my provider. I followed the instructions the way my provider provided" (P1).

Spirituality. Participants heavily relied on their relationship with God for emotional support. P6 mentioned

> about the way I care of my diabetic, number one is God. He [God] is the one that is giving me direction, helping me out, it is not my power. It is God's power. It's God's power that is helping me get through this diabetic. Thank God for that.

Resources used to support T2DM self-management behaviors. The most commonly mentioned resources used to support T2DM self-management behaviors were: (1) informational support and (2) appraisal support. Some participants relied on media such as television or radio and print and Internet sources to get information. P4 stated, "I started reading books. . . . All those pamphlets when I go to the provider, I take them. I'd go home and read them and then I understood how the diabetes works, how the system manages, what causes diabetes." Some participants considered their health care providers as a source of appraisal support. Health care providers'

feedback on improved diabetes control motivated these participants to adhere to diabetes self-management behaviors. For example, "Sometimes he [provider] tells me you are managing your blood sugar very well. At least I get compliments from my provider, then I know I'm doing a good thing" (P1).

Discussion

Knowledge of diabetes varied significantly among the participants, ranging from exceptional to no knowledge. Consistent with the findings of Gele et al,[39] participants shared their perceptions of the effects of American foods and beverages on T2DM and voiced struggles with adopting and adhering to T2DM dietary recommendations. The participants' assumption was that T2DM would be well managed or cured by replacing North American food with home country food or the Sub-Saharan African diet. Similar to our findings, Brathwaite and Lemonde[40] reported that African immigrants in Canada were not willing to give up their traditional African foods even though these foods were high in carbohydrates or starches.

Other factors found in our study to be inhibitors of T2DM self-management among Sub-Saharan African immigrants with T2DM included being unaware of the disease, being unfamiliar with disease prevention, and the beliefs of only seeking health care when ill. These findings are consistent with a study conducted in Minnesota that showed consulting with a health care provider for disease screening and illness prevention was a new concept for Somalis who were accustomed to only seeking health care when ill.[41] Another study found that Somali immigrant women in Oslo did not use preventive health care in regard to diabetes because chronic disease risk factors such as obesity, sedentary lifestyle, and unhealthy eating alone did not rise to the level of being immediately life threatening.[39] Thus, it is likely that T2DM goes undetected until experiencing complications because Somali immigrants only perceive a health problem needing health care attention when a disease is accompanied by symptoms such as fever, diarrhea, pain, and cough.[42]

To achieve and maintain blood glucose levels, participants in the current study expressed that having a daily routine promoted commitment to daily T2DM self-management activities, including blood glucose monitoring, adopting a healthy diet, complying with medications, and engaging in physical activity. This is consistent with Visekruna et al,[43] who found that despite lifestyle demands, participants who established and maintained daily routines achieved and sustained good control of their blood glucose. Our finding that family support was critical to participants' adaptation to T2DM paralleled that of Moser et al,[44] who found that the support that participants received from family members was essential to their commitment to T2DM self-management behaviors. Additionally, feedback from health care providers on improved blood glucose control was a motivational factor in adhering to diabetes self-management behaviors. Njeru et al[45] also found that some participants perceived their health care providers' comments on positive results, such as improved diabetes control and weight loss, as encouragement and reinforced healthy self-management behaviors.

Our findings support Meleis et al's[29] middle range theory of transitions that emphasizes health-illness transition readiness of individuals transitioning to T2DM self-management. This is in line with Huber et al's[46] emphasis on shifting the focus from health to the ability to adapt and self-manage a chronic disease in the face of physical, social, and emotional challenges. As outlined by Meleis et al,[29] awareness influences engagement, and there is no active engagement in the process of transition when a person is unaware of the changes that are occurring. The participants of the current study were not actively engaged in diabetes self-management behaviors because they were unaware of T2DM.

Limitations

This study had several limitations. Although the small sample (N = 10) met saturation criteria, it consisted of only individuals from 1 county in the US. Additionally, excluding Sub-Saharan African immigrants with T2DM who could not communicate in the English language increased the likelihood of missing descriptive data. Nevertheless, our study provides insights into health-illness transition experiences with T2DM self-management of Sub-Saharan African immigrants.

Implications for Practice and Research

The knowledge gained from this study can strengthen immigrants' T2DM self-management behaviors and culturally relevant care. The findings of the study shaped by the middle range theory of transitions provides valuable data for health care professionals who provide care for Sub-Saharan immigrants and their families who are experiencing T2DM

Table 2

Stages of Health-Illness Transition

Stages	Strategies
Stage of illness/diagnosis shock and denial of the new situation	• Assess the individual's emotional responses: reaction of the individual to new illness/diagnosis • Assess if the individual is still holding on to old cultural beliefs, attitudes, and influences • Assess other changes/transitions the individual is experiencing, especially related to the new culture and social norms
Stage of initial awareness	• Assess if the individual is becoming emotionally engaged in the new situation (T2DM)
Stage of recognizing and accepting the reality of the new situation	• Assess the individual's full awareness of the changes that are occurring • Assess the individual's receptivity to modify old cultural beliefs, attitudes, and influences on T2DM to include new T2DM knowledge and self-management practices
Stage of adjusting oneself	• Assess the individual's network connection status: Does the individual feel connected to social, kinship, and health care networks? • Assess interaction status: Has interaction with community resources increased? • Assess confidence status: Is the individual more confident to take more control over his or her actions?
Stage of integration/adaptation	• Assess the level of mastery of the skills or behaviors needed to self-manage T2DM: Does the individual feel that he or she has incorporated T2DM self-management skills into his or her daily life? • Assess the individual's integrative identity: (1) Has the individual developed appropriate routines for his or her illness to fit within his or her lives? OR (2) Does the individual feel that he or she has learned to live well with T2DM?

Abbreviation: T2DM, type 2 diabetes mellitus.

health-illness transitions.[47] Health care professionals have an important role to play in assisting Sub-Saharan African immigrants to decrease inhibitors of successful T2DM self-management. Adequate assessment of their stage in the transition process is critical to promote successful T2DM self-management and maintain good quality of life (Table 2). Assessment of diabetes knowledge, current T2DM self-management behaviors, and facilitators and barriers to T2DM health-illness transitions in Sub-Saharan African immigrant communities is critical for informing diabetes educators in the development of culturally tailored and sustainable diabetes programs. Future studies should include Sub-Saharan African immigrants with T2DM who do not communicate in English.

References

1. Sanou D, O'Reilly E, Ngnie-Teta I, et al. Acculturation and nutritional health of immigrants in Canada: a scoping review. *J Immigr Minor Health*. 2014;16(1):24-34.
2. Agyemang C, Addo J, Bhopal R, et al. Cardiovascular disease, diabetes and established risk factors among populations of sub-Saharan African descent in Europe: a literature review. *Global Health*. 2009;5:7.
3. Friis R, Zngve A, Persson V. Review of social epidemiologic research on migrant's health: findings, methodological cautions, and theoretical perspectives. *Scand J Soc Med*. 1998;26(3):173-180.
4. Hyman I. Immigration and health, health policy. http://www.hc-sc.gc.ca/sr-sr/alt_formats/iacb-dgiac/pdf/pubs/hpr-rps/wpdt/2001-0105-immigration/2001-0105-immigration_e.pdf. Accessed July 22, 2017.
5. Rock M. Sweet blood and social suffering: rethinking cause-effect relationships in diabetes, distress and duress. *Med Anthropol*. 2003;22:131-174.
6. Spitzer DL. Stress, migration, gender & type 2 diabetes. http://pcerii.metropolis.net/ViennaConference/spitzer.pdf. Accessed July 22, 2017.
7. Terán LM, Belki KL, Johnson CA. An exploration of psychosocial determinants of obesity among Hispanic women. *Hisp J Behav Sci*. 2002;24(1):92-103.
8. Tull ES, Chambers EC. Internalized racism is associated with glucose intolerance among black Americans in the U.S. Virgin Islands. *Diabetes Care*. 2001;24(8):1498.
9. Krupic F, Biscevic M, Sadic S, Custovic S, Fatahi N. Diabetes mellitus type 2 as a part of daily life experiences of elderly

Bosnian immigrants living in Sweden. *J Family Med Community Health*. 2015;2(2):1029.
10. McEwen MM, Baird M, Pasvogel A, Gallegos G. Health-illness transition experiences among Mexican immigrant women with diabetes. *Fam Community Health*. 2007;30(3):201-212.
11. Zeng B, Sun W, Gary RA, Li C, Liu T. Towards a conceptual model of diabetes self-management among Chinese immigrants in the United States. *Int J Environ Res Public Health*. 2014;11:6727-6742.
12. Nam S, Song H-J, Park S-Y, Song Y. Challenges of diabetes management in immigrant Korean Americans. *Diabetes Educ*. 2013;39(2):212-221.
13. Zong J, Batalova J. Sub-Saharan Africa immigrants in the United States. http://www.migrationpolicy.org/article/sub-saharan-african-immigrants-united-states. Accessed July 11, 2015.
14. American Community Survey. Sub-Saharan African-born immigrants. http://immigrationpolicy.org/sites/default/files/docs/african_fact_sheet.pdf. Accessed July 22, 2017.
15. US Census Bureau. U.S. Census Bureau projections show a slower growing, older, more diverse nation a half century from now. https://www.census.gov/newsroom/releases/archives/population/cb12-243.htm. Accessed July 22, 2017.
16. Venters H, Gany F. African immigrant health. *J Immigr Minor Health*. 2011;13(2):333-344.
17. Filippi MK, Faseru B, Baird M, Ndikum-Moffor F, Greiner KA, Daley CM. A pilot study of health priorities of Somalis living in Kansas City: laying the groundwork for CBPR. *J Immigr Minor Health*. 2014;16:314-320.
18. Shipp MP-L, Francis SA, Fluegge KR, Asfaw SA. Perceived health issues: a perspective from East-African immigrants. *Health, Culture and Society*. 2014;6(1):11-32.
19. American Diabetes Association. Standards of medical care in diabetes—2007. *Diabetes Care*. 2007;30(suppl 1):S4-S41.
20. Archeampong I, Haldeman L. Are nutrition knowledge, attitudes, and beliefs associated with obesity among low-income Hispanic and African American women caretakers? *J Obes*. 2013;123901.
21. DesMeules M, Gold J, McDermott S, et al. Disparities in mortality patterns among Canadian immigrants and refugees, 1980-1998: results of a national cohort study. *J Immigr Minor Health*. 2005;7(4):221-232.
22. Esse A. Somalia: history, culture & health (presentation). http://www.health.state.mn.us/divs/idepc/refugee/globalbbsom.pdf. Accessed July 22, 2017.
23. Lynk M. Diagnosing ways to reduce diabetes and chronic diseases in an era of reform. http://northpotomac.patch.com/blog_posts/diagnosing-ways-to-reduce-diabetes-and-chronic-diseases-in-an-era-of-reform. Accessed July 22, 2017.
24. McGuigan CL. Diabetes in the Eritrean and Ethiopian community: cultural information and recommendations for diabetes educators. http://ethnomed.org/clinical/diabetes/diabetes-in-the-eritrean-and-ethiopian-community-cultural-information-and-recommendations-for-diabetes-educators. Accessed March 16, 2014.
25. Metropolitan Area Agency on Aging. Demographic and service data on Oromo elders. http://www.tcaging.org/downloads/2010o.pdf. Accessed July 22, 2017.
26. Sewali B, Harcourt N, Everson-Rose SA, et al. Prevalence of cardiovascular risk factors across six African immigrant groups in Minnesota. *BMC Public Health*. 2015;15(411):1-7.
27. Weiland ML, Morrison TB, Cha SS, Rahman AS, Chaudhry R. Diabetes care among Somali immigrants and refugees. *J Community Health*. 2012;37(3):680-684.
28. Haile SK. The process of African immigrant incorporation and social mobility and its impact on health care access and utilization. Thesis presentation, University of Pittsburgh.
29. Meleis AI, Sawyer LM, Im EO, Messias DKH, Schumacher K. Experiencing transitions: an emerging middle-range theory. *Adv Nurs Sci*. 2000;23(1):12-28.
30. Meleis AI. Transitions theory. In: Smith MC, Parker ME, ed. *Nursing Theories and Nursing Practice*. Philadelphia, PA: F.A. Davis Company; 2015.
31. Meleis AI, Trangenstein PA. Facilitating transitions: redefinition of the nursing mission. *Nurs Outlook*. 1994;42:255-259.
32. Kralick D, Visentin K, Van Loon A. Transition: a literature review. *J Adv Nurs*. 2006;55(3):320-329.
33. Schumacher KL, Meleis AI. Transitions: a central concept in nursing. *Image J Nurs Sch*. 1994;26(2):119-127.
34. Sandelowski M. Focus on research methods: whatever happened to qualitative description? *Res Nurs Health*. 2000;23(4):334-340.
35. Wong DL. Transition from hospital to home for children with complex medical care. *J Pediatr Oncol Nurs*. 1991;8:3-9.
36. Sandelowski M. What's in a name? Qualitative description revisited. *Res Nurs Health*. 2010;33:77-84.
37. Elo S, Kyngäs H. The qualitative content analysis process. *J Adv Nurs*. 2008;62(1):107-115.
38. Palmgren PJ, Laksov KB. Exploring chiropractic students' experiences of the educational environment in healthcare professional training: a qualitative study. *BMC Med Educ*. 2015;15(128):1-11.
39. Gele AA, Torheim LE, Pettersen KS, Kumar B. Beyond culture and language: access to diabetes preventive health services among Somali women in Norway. *J Diabetes Res*. 2015;2015:549795.
40. Brathwaite AC, Lemonde M. Health beliefs and practices of African immigrants in Canada. *Clin Nurs Res*. 2016;25(6):626-645.
41. Pavlish CL, Noor S, Brandt J. Somali immigrant women and the American health care system: discordant beliefs, divergent expectations, and silent worries. *Soc Sci Med*. 2010;71(2):353-361.
42. Mador J. Battling diabetes another hurdle for Somali immigrants. http://www.mprnews.org/story/2008/07/06/somalidiabetes. Accessed July 22, 2017.
43. Visekruna S, Edge DS, Keeping-Burke L. "Being in balance": self-management experiences among young women with type 1 diabetes. *Qual Rep*. 2015;20(9):1373-1393.
44. Moser A, Van der Bruggen H, Widdershoven G, Spreeuwenberg C. Self management of type 2 diabetes mellitus: a qualitative investigation from the perspective of participants in a nurse-led, shared-care programme in the Netherlands. *BMC Public Health*. 2008;8(91):1-9.
45. Njeru JW, Patten CA, Hanza MMK, et al. Stories for change: development of a diabetes digital storytelling intervention for refugees and immigrants to Minnesota using qualitative methods. *BMC Public Health*. 2015;15(1311):1-11.
46. Huber M, Knottnerus JA, Green L, et al. How should we define health? *BMJ*. 2011;343:d4163.
47. Bridges W. *Transitions*. Reading, MA: Addison Wesley; 1980.