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Diabetes knowledge, risk and severity perceptions, lifestyle behaviours and management barriers among Sub-Saharan African immigrants living in the UK: an ethnographic study

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Abstract

Background Type 2 diabetes shows greater incidence among ethnic minority groups than their indigenous counterparts, including Sub-Saharan African migrants in the UK. Little is known about their perceived knowledge of diabetes risks, severity and barriers, and the impact on their behaviours. Knowledge of their diabetes health is viewed through studies of other ethnic minority groups, making it difficult to differentiate findings relevant to Sub Saharan Africans and the associated impact of their unique sociocultural contexts. This study sought to bridge this knowledge gap.

Methods Data for this ethnographic study was generated from eleven participants through in-depth observations, conversational interviews, field/reflective notes during food purchasing, meal preparation and consumption over a period of six months in Southeast London. Data was analysed using thematic analysis.

Results Participants expressed extensive encounters and experiences with diabetes, yet, they had poor diabetes knowledge and perceptions regarding its risks and severity with many perceived barriers. Diabetes was perceived not to be serious as HIV/Aids, cancer, painful and infectious diseases, thereby given limited attention. Participants saw their cultural foods as nutritious, healthy and of good quality and were preferred over other diets, although their cultural foods were carbohydrate rich and mainly sold in processed forms. Participants complained of limited availability of fresh cultural produce and dislike for alternatives due to unfamiliar looks, textures and tastes. Culturally, Bulky weight was preferred over slimness. Slim individuals were stigmatised. Poor association of physical activity with diabetes management, time, motivation, limited support, laziness and tiredness hindered engaging in exercise. Difficulty navigating the healthcare system, time and costs prevented use of healthcare services.

Conclusion Culturally structured and targeted interventions to raise diabetes knowledge, risks and severity perceptions and the benefits of effective management of type 2 diabetes will decrease perceived barriers to achieve

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desired outcomes. There should be ongoing education in communities, associations, and churches to raise diabetes awareness to modify their lifestyles. 'Health-matching', where patients are seen by providers conversant with their cultural beliefs and practices, should be considered by primary healthcare providers. Increased imported foods from Sub-Saharan African countries should be encouraged by food importers.

Keywords Sub-Saharan Africans, Immigrants, Diabetes, Perspectives, Diet, Weight, Exercise/physical activity, Culture, Nursing, Ethnography

Backgrounds

The impact of Covid-19 worldwide emphasised the apparent disparity in diabetes health among ethnic minority populations, as well as the urgent need to bridge the diabetes gap through evidence-based culture-sensitive interventions. Among migrants in the UK, SSA and Afro-Caribbean communities have more significantly raised HbA1c levels than South Asians and white Europeans [1]. West African immigrants have a high incidence of diabetes [2]. Sub-Saharan Africans and Afro-Caribbean migrants diagnosed with diabetes, have significantly raised HbA1c levels than their European counterparts [3]. They also have worse glycaemic control and increased risk of developing microvascular and macrovascular complications [4]. Morbidity and mortality are also higher in ethnic minority populations [5]. The onset of diabetes occurs 10 years earlier in Africans and diabetes prevalence in Africans and Asians is predicted to be 2 to 3 times greater by 2030 [6]. Despite their diabetes risks, SSA immigrants are more likely to receive suboptimal care resulting in greater morbidity and mortality. Poor diabetes perception, failure to recognise symptoms, and inadequate management result in worse diabetes experiences and undesirable outcomes [7]. Also, giving diabetes management advice to diagnosed individuals without considering their sociocultural contexts may result in poor experiences and outcomes. Self-management of diabetes requires adequate diabetes knowledge. Culturally competent diabetes interventions increase diabetes knowledge, improve glycaemic control and self-efficacy [8, 9]. Such interventions recognise the impact sociocultural backgrounds and experience may have on diabetes perspectives and practices [10]. There have been no studies of type 2 diabetes perspectives and lifestyle behaviours of SSAs living in the UK. This exploratory ethnographic study aimed to understand SSA-UK immigrants' perceived diabetes knowledge, risks, severity, barriers and behaviours.

Aim

The aim of the study was to explore diabetes knowledge, risks and severity perceptions, lifestyle behaviours and management barriers among SSA immigrants living in the UK.

Methods

Design

A qualitative ethnographic study was conducted to enable data collection by combining the insider perspective and the outsider analysis known as 'thick description' [11]. Ethnography was used to gain deep insight of the sociocultural factors and experiences that influence diabetes perspectives and lifestyle behaviours of SSA immigrants living in the UK. Ethnography facilitated a close and prolonged engagement for six months from July - December 2017, enabling the participants' perspectives and behavioural patterns to be investigated within their sociocultural context.

Ethnography is distinct from the other qualitative approaches like phenomenology, grounded theory and narrative studies despite that they share philosophical and theoretical beliefs [12],. Ethnography comprises a group of methods that require 'direct and sustained social contacts' with participants and in-depth writing (thick description) of the encounter of human experience [13]. Through close and prolonged engagement with the participants, the researcher is immersed in the daily lives and culture of the population for a period. This period of immersion facilitates building rapport and gaining the trust that allow the participants to share information that will aid in understanding the topic. Ethnography may use observation, field and reflective notes for data collection where individual's or group's behaviours can be observed and described within the context of their real world [14]. Consequently, these basic data collection methods allow for rich data and data triangulation that yield credible result. The observer may participate and may use conversation interviews to enhance observation [15]. Data analysis involves in-depth interpretation of meaning and purposes of human behaviours where findings are presented as narrative descriptions [16]. Ethnography is to some extent driven by chance [17] and has made a significant impact on qualitative research due to argument on ethnographic observations documentation [18] and opposition of the ethnographic process to codified application methods [19]. Ethnography is an appropriate research methodological approach to study individuals, populations (like SSA) and their culture [20] to understand issues of interest like diabetes from their perspectives.

Study setting

London has the highest number of SSA immigrants at 58% than all the other cities in England and Wales [21]. Most of this population reside in the Southeast of London where this study was conducted. Southeast London is a densely populated area with a population increase of 22.8% since 2002 to its current estimate of 1.1 million people. There are 7.9 thousand residents per Km^2 according to 2018 estimate. It is a London sub region comprising of five cities. The setting was selected for this study because, according to the Office of the National Statistics [22], the SSA population has shown more growth than any other minority group in the last two decades. Black Africans migration to the UK which started after that of the Asian and the African-Caribbean, has maintained an increase since the late 1980s. Prior to the late 1980 s, Black African migration to the UK was about 5000 per year. The number reached 20 thousand in the 1990s. Since 2000, the number is said to have reached and has remained about 30 thousand persons migrating to the UK each year. In 2008, Black African immigrants' population in the UK, was almost half a million. Six countries from which there were 20 thousand or more Black African immigrants in the UK in 2008 were Nigeria (with the highest number of immigrants at 125 thousand), Ghana, Somalia, Zimbabwe, Uganda and Kenya, most of whom live in the South East Area [23]. Given the political unrest, tribal conflicts and socioeconomic instability experienced worldwide especially among African nations, SSA population has continued to rise both in the UK and other high-income countries through immigration. Secondly, African activities were significantly conspicuous in the area. Many African food stores, restaurants, African churches and businesses there, fostered a strong African connection and way of life.

Sample characteristics

A sample of SSA immigrants was recruited through purposive and snowball sampling, from July-December 2017. Participants who self-identified as SSA to the third generation were included. These were immigrants, their families and descendants who migrated from SSA to the UK for various reasons such as to escape from tribal rivalries, religious and political violence and wars, economic hardship/poverty, search of better education, healthcare, career advancement, better job offers and business opportunities. Other inclusion criteria were diagnosed or not diagnosed with diabetes, male or female, 18 years or older, availability, willing to participate, and able to communicate their perspectives.

Sampling took place after researcher immersion in the setting for over two months, interacting with the community in a process described as the "big net approach" [14]. During this time relationships and rapports were developed by using culturally sensitive strategies, including extending 'African hospitality'. For example, on one occasion, the researcher shared some bananas with a woman who agreed to share her table in a fast-food restaurant. On another instance, the researcher shared some cookies with a woman seated nearby on a train. Each hospitable act and response initiated a conversation in 'Pidgin English[1], indicating 'going local' to signal oneness with the persons. Informed consent to participate was obtained from all the participants in the study while ensuring confidentiality as described under the 'Ethics approval and consent to participate' section.

Data collection

Data were collected through observation, conversational interviews, field and reflective notes, audio recordings and photos, considered the essential data collection processes in an ethnographic study [24]. Nine participants were observed in their homes during food preparation and at mealtimes. At some times family members were present to participate in the cooking and/or meal and made contributions that led participants to expatiate on the object of observation or discussion. With consent, participants' pantries, kitchens and refrigerators were also observed for insight into the type of food purchased, stored and consumed. Four participants, including two that were not observed at home were observed while shopping in African and other food stores and in restaurants while eating. There was no observation schedule, instead, the researcher aimed for a more constructivist approach to being in the field by allowing things to unfold within their natural context. Through data triangulation, missing observations or hearing significant things due to distraction either during writing or responding to another family member were avoided.

Open-ended conversational interview guide was used with aims and goals. Questions were also driven by the observed behaviours and/or actions of the participants to allow the participants to elaborate on the reasons for the behaviours and actions. Clarifying questions were asked to minimise inaccurate documentation, interpretation and representation of the data. In those situations, the conversations and observations were simultaneous and complimented each other and enhanced observation (Table 1).

"Participatory field notes" were taken during observation and conversations to briefly document occurrences to avoid interrupting the flow of the conversation. Immediately after each encounter, remembered field notes were made, elaborating on the brief field notes. To avoid unnecessary distractions and embarrassment

[1] Language involving communicating in a grammatically simplified English language (examples: 'How far? = Hello; 'How you dey? = How are you?

Table 1 Samples of the open-ended questions guide used to collect data during the observations and conversation interviews for this study

To assess diabetes knowledge	"Tell me about your experience with diabetes"
To understand dietary habit	"How often do you and your family eat out?"
To explore diabetes perception	"Could you share with me what diabetes mean to you"
Exploring perception of weight role in diabetes	"What does overweight mean to you" or "How would you describe overweight?"
A participant that said she was certain she could not get diabetes, though both parents were diabetics.	"You said you know you cannot get diabetes and so, you do not worry or think about it, could you elaborate on that"
For a participant that said she cooked with only groundnut oil and not canola or vegetable oil	You said you always cook with groundnut oil instead of canola or vegetable oil, why was that"
For a participant that was observed buying food stuff in bulk: ex 10 packs of raw of peanut.	"I saw you bought many packs of peanuts, could you explain the reason"

to participants in public places, a small audio recorder was used with consent to allow the researcher to pay full attention. To illustrate the participants' food choices, photographs of purchased food items, prepared dishes, pantries and refrigerators were taken during data collection. Data were collected between July 2017 and December 2017. Data collection and analysis ran concurrently.

Following the period of immersion in the setting, the researcher conducted several observation and interviews with SSA immigrants to gain insight into the study topic. Sample size was not determined a priori [25]. Some of the participants were observed for an extended time to seek idiographic study understanding [26]. Mason [27] suggests that in conducting a qualitative inquiry, if the principles of a qualitative study are adhered, the sample size should be based on the concept of saturation. Saturation as was encountered in this study, when further observation and conversation yielded no new information was the basis for determining when to stop data collection.

Piloting

The relevance of the open-ended questions on the conversation interview guide and the effectiveness of the recording process were initially piloted to determine their appropriateness in collecting data, and to assess the feasibility of adapting them at various settings. The data from the pilot study was analysed and the information obtained with these data collection tools was found to be relevant in answering the research aim. The only adjustment made following the piloting was to adapt the strategy for taking 'participatory field notes' to capture non-verbal cues that could not be recorded. Subsequently, data from the pilot test was included in the study since there were no major changes made.

Data analysis

Data were anonymised to conceal participants' identity and transcribed verbatim to allow the voices of the participants to be heard. Comprehensive field notes were recorded from the observations and photographs data to capture the contextual details for analysis. Data analysis followed an inductive thematic approach [28]. Codes, patterns/categories and themes were determined after series of interactions with the data and constant reflection on the question and purpose. Data analysis and interpretations were extensively reviewed by the three researchers after the initial analysis by one researcher. Themes were reviewed against the data to ensure that they accurately represent the data before assigning relevant names and descriptions. Disagreements were adequately addressed and resolved by all the researchers before writing up the findings.

Laughs and audible utterances were recorded to be replayed over and over to acquaint with the participants words and to retain the identity of direct quotes. But nonverbal expressions like gestures, facial expressions, body languages such as nodding, postures, eye contacts and signalling with hands, and feelings of the senses like smell, food aroma and things that could only be observed could not be recorded but captured through field and reflective notes. The field notes helped to capture the place and context under which recordings were done.

Rigour

Lincoln and Guba's [29] methodological framework of trustworthiness encompassing credibility, dependability, confirmability and transferability were used to establish rigour and robustness of the study process. Prolonged engagement in the field, thick descriptions of both the setting and participants characteristics, triangulation of data collection and use of direct quotes to represent participants voices were the ways that trustworthiness was achieved. Reflexivity began prior to getting in the field and continued through the research. The topic, design and conduct of the study as well as the assumptions and preconceived notions and feelings about diabetes and the African community were carefully reflected and described to leave an audit trail for heightened dependability of the study. For instance, through reflexivity, before data collection, the researcher recognised the potential impact of her social identity as a female African by birth and nationality, with a nursing background, living without diabetes, in the UK. To address these issues, the researcher approached the field with a resolve to actively develop rapport by possible ways including showing respect for the community, listening attentively

Table 2 A summary of the study findings, outlining the generated themes and the subthemes

Theme 1 Diabetes knowledge & meanings	**Theme 2 Dietary beliefs & practices**	**Theme 2 cont…. Weight beliefs & practices**	**Themes 3 Perceived diabetes risk**	**Themes 4 Perceived diabetes severity**
1.1 Perceived diabetes knowledge Widespread experience & contact with diabetes. Everyone knew someone living with type 2 diabetes ✓ Self, ✓ Family member(s), ✓ Friend(s) and/or ✓ Colleague(s) 1.2 Perceived diabetes meaning Different meanings ascribed to diabetes due to poor diabetes knowledge, resulting in: ✓ Poor perceived risk, (increased susceptibility) ✓ Poor perceive severity ✓ Many perceived barriers ✓ Poor symptoms & complications recognitions Diabetes not perceived as: ✓ Serious ✓ Painful ✓ Infectious ✓ Permanent	2. 1. Dietary belief SSA cultural food perceived as healthy 2.1.1. Dietary practices Adherence to cultural carbohydrate rich dishes like: ✓ Cassava, yam, cocoyam, rice, potatoes, corn, plantain, wheat, corn, noodles and do forth Protein included ✓ Beans, red meat/ meat parts & fish. Some carbohydrate rich common snacks including ✓ Pies, bread, chin-chin, puff-puff, egg rolls, gizdodo, groundnut and so forth Vegetables ✓ Limited availability of fresh cultural fruits & vegetables ✓ Dislike for some available fruits & vegetable alternatives due to taste	2.2 Weight beliefs Bulkiness perceived as ✓ Health & evidence of living ✓ Males fulfilling their gender roles ✓ The perfect body built for SSA Favoured & preferred 2.2.1 Weight beliefs from shared experiences of some slim participants Slimness perceived as hunger, poverty, ill health ✓ Some slim individuals take supplements to eat more to add weight to be accepted. 2.3 Exercise beliefs & practices Types of exercise ✓ Walking ✓ Dancing ✓ Hardworking Perceived reasons for observed limited exercise ✓ Limited time, ✓ Lack of motivation and social support, ✓ Laziness & tiredness ✓ May be only necessary in ill-health ✓ Not forming the habit early in life 2.4 Health beliefs & practices Delayed healthcare use ✓ Self-medication with over-the-counter medicines and/or traditional medicines ✓ Spiritual healing ✓ Denial Perceived reasons for scarce use of healthcare ✓ Not forming the habit of frequent check-up early ✓ Not used to going for check-ups in the absence of an illness back in Africa ✓ Booking for GP & hospital appointments as opposed to walk-ins in most SSA countries ✓ Difficulty in negotiating the healthcare system ✓ Delay in delivery due to not being taken seriously by health providers ✓ No culture sensitive advice from healthcare workers resulting in lack of trust ✓ Denial ✓ Cost	Poor perceived diabetes risks due to poor knowledge of diabetes, evidenced by diet, weight, exercise & healthcare-use beliefs & behaviours resulting in poor diabetes management & outcomes.	Poor perceived diabetes severity due to poor knowledge, poor perceived risk & many perceived barriers, resulting in poor outcomes.

and allowing the participants' voices to be heard. To sympathize with those that were living with diabetes and be empathic about situations that might seem helpless and not judge or condemn [30]. The power dynamics that operate in social research and the advantage that researchers could possibly have over the researched were constantly reflected. A reflective note other than field notes was kept, documenting the researcher's feelings, including how she was received, the interactions with the participants and any significant thing that occurred in the milieu. Constant reflexivity increased the awareness of the researcher's assumptions and perspectives and their subjectivity and that others have equal rights to their perspectives and beliefs which if given the opportunity to be heard, may add immensely to the study. Being mindful that reflexivity is based on the concept that reality is a social construct [31] and context and experiences inform knowledge. Consequently, through reflexivity, the researcher learned to view the participants' world with the eye of an ethnographer [32] allowing participant and researcher dynamic that enabled the generation of the data that helps to further understanding and knowledge of SSA perspectives on diabetes.

Findings

This ethnographic study explored in-depth, eleven SSA immigrants' perceived diabetes knowledge, risks, severity, barriers and lifeways. The participants were nine women and two men, with ages ranging from thirty to sixty years. At the time of the study, all had finished high school, one had a master's degree, one was a master's student, two were in college for degrees, and others were

mostly college graduates. All spoke English and 'Pidgin English'. One was a second generation African, and others were first generation Africans living in the UK ranging from one to more than fifteen years. There were ten self-identified Nigerian immigrants, and one Ghanaian immigrant. Two participants self-identified as persons living with type 2 diabetes. One of them shared to have lived with type 2 diabetes for 13 years and was diagnosed in the UK. The other did not disclose the number of years of living with type 2 diabetes nor the place of the diagnosis. Others shared that they were not living with type 2 diabetes at the time of this study.

Four major themes identified from data analysis include: 1). Perceived Diabetes Knowledge and Meaning 2). Diet, Weight, Exercise and Healthcare Use Beliefs and Behaviours, 3). Perceived Diabetes Risks, and 4). Perceived Diabetes severity.

Perceived diabetes knowledge and meaning

Perceived diabetes knowledge

There was widespread contact with persons living with diabetes and experience of living with diabetes among the participants as indicated by the three quotes below. All the participants knew at least one family member, friend or colleague who was affected which may suggest a widespread contacts and experiences of diabetes among the SSA population. Two participants self-identified as persons living with type 2 diabetes. Others may not have known their own diabetes status.

> *"Am a diabetic patient. I have had diabetes for 13 years now and when I tell people they don't believe it because they think a diabetic patient must be dying, so that is what I can say about it" (Participant 1).*

> *"Yes, I have had an experience. My dad is diabetic, my father in-law is, and I think my mother in-law is. Then my late grandfather too on my dad's side. In fact, I come from a family of diabetes. Like my grandfather, he was diabetic for a very long time over 30 years… I think my dad's sisters like two of them or more even have diabetes. I think it's something that runs in my family" (Participant 2).*

> *"Yea, my family. My mum is diabetes, and my dad also was diabetic before he passed, so it's something at the back of my mind, you know…, yeah" (Participant 3).*

Perceived diabetes meaning

Despite the widespread contact with persons living with diabetes or experience of living with diabetes, diabetes was interpreted and represented as a condition not to be scared off or avoided. Only few acknowledged diabetes as serious. Interpreting and representing diabetes as unserious, influenced participants perceived diabetes effects and their behaviours towards recommended lifestyle modifications.

> *"Diabetes within African community, diabetes within blacks, especially I want to talk about Nigerians, people don't believe that diabetes really mean anything. But diabetes is very serious. You can get blind, you can have stroke, you can have, you can just die, within 10 mins you can give up your life. If your blood sugar is very high you are in trouble, if it is very low, you're in trouble. But you can deal with, (a pause), we are in England, so it's easy to deal with diabetes. There are many things going on, there're many discussions going on and if you're very close to your internet there're many information going on about black Africans with diabetes" (A quote from a participant who self-identified as living with type 2 diabetes).*

> *"…But I have not really seen it as a life-threatening disease for me to want to seem to ask, because if like someone say, oh HIV, maybe I will say oh, what is that… because they say it's deadly. But I have not seen diabetes as life threatening disease for me to want to be concerned to say oh, what does it do to you, can it kill because I never thought it could kill…" (Participant 6).*

> *"In fact it got to an extent you know, those that have it when they discuss it, they said, 'it is blood sugar', that if you have blood sugar monitor, and you check your blood sugar in the morning and see the level, if the blood sugar has reduced to 130, you know what you will do for the day. Like that day you are free to drink and do what you like. But if you check it and it's high, you cut down for the day and take your medication when you come back. So, they said as far as the drug is there, you can bring the level down and drink and live your normal life" (Participant 8).*

People were concerned about painful, infectious, or stigmatising conditions. Unfortunately, diabetes is not seen as falling into these categories. For some, diabetes was not a permanent condition but could be present or absent at certain times of the day, and the changing status dictated how it was self-managed. This belief negates diabetes chronicity and hinders efforts towards prevention and control. This mind-set may mean less effort to engage in preventive and control measures resulting in continual rise among SSA.

Consequently, poor diabetes knowledge was a barrier to prevention and control, despite many encounters

and experiences. Individually ascribed meanings underpinned by experiences, sociocultural and religious contexts influenced perspectives about diabetes susceptibility, severity, symptom recognition and association with complications, thereby hindering the ability to adopt recommended lifestyle.

Diet, weight, exercise, healthcare use beliefs and behaviours

Dietary beliefs

African diets were perceived by all as natural and quality due to their cultivation, preservation and preparation methods and not to be entirely the cause of type 2 diabetes.

Most first-generation SSA immigrant participants shared that the food they ate when they were growing up in Africa was fresh, unprocessed and healthy. Most participants shared that it would be difficult to forsake their cultural food because they had eaten it for a long time and had acquired the taste. So, even here in the UK, they craved their food and did not have appetite for other ethnic food than what they knew and ate growing up.

> *"Diabetes should not even be killing Nigerians and Ghanaians because we have good food" (Participant 1).*

> *"Is still that taste bud, you know when you are used to a particular type of food when you get here you still crave for it. Even somebody coming from Nigeria you should be tired of eating those type of food, but when you still come in the same day, you're craving for it" (Participant 4).*

> *"Because you know, 'you do not learn left handedness at old age.' This is the food you were brought up with, all of a sudden you are asked to start chewing leaves and continue to chew salad, you understand, it's not easy" (Participant 5).*

Dietary practices

Cultural cuisines were mostly favoured and eaten often, though the majority of these were carbohydrate rich. Common diets were rice, plantain, cassava, yam, corn, oat, cocoyam, wheat and 'swallow synonymous with fufu' which is a popular West African dish, made of cooked dough from any or a combination of the above produce with varied preparation methods and eaten with variety of traditional soups. Beans, meat and cultural vegetables were also eaten, although fresh cultural vegetables were not always available in cultural shops and other food shopping places and alternatives like spinach were not favoured for several reasons.

> *"My best food is rice first or all, before I thought my best food was yam and egg sauce, but I've thought about it really, can I eat yam and egg sauce straight one week, no. But I can eat rice straight one month without complaining that I am eating one thing. That's the only food I can eat like that. Any other food 2 days 3 days I might complain that I am eating one thing, you know…" (Participant 5).*

> *"…I have four, (the Participants children), two like pounded yam, two doesn't like it. One likes egusi soup more (laughs), and the other likes ehm, is it vegetable or okro" (Participant 9).*

> *"…am not even a food person, but I can snack on things frequently, stupid things I will say, in fact I snack on, you know, like ehm, on ehm dough, on dough things more like bread, puff puff, meat pie all those kind of things, but am hoping to get back to my, you know the way I use to be" (Participant 11).*

> *"Because we are not used to the vegetables. Is it the kind of vegetables they have here, salad is not our kind of food. Chewing! What we believe is vegetable is having ugu and okro and eh…, That should be our vegetable because it has taste. So, the one here we are looking at it as if someone is just chewing goat something, no taste. So, people don't like it. (Participant 6)*

Cultural diets were perceived as quality, healthy and safe which did not make them sick in Africa where they ate them all the time. They believed that the kind of produce sold as African foods in the UK were of low quality and tasted different, raising doubt that they came from Africa. They were compelled to eat them because of their love of and crave for their traditional cuisines:

> *"Actually no, I don't think it's the same food even though sometimes you do get fresh food…, it is not the same thing" (Participant 7).*

Weight beliefs and practices

The importance of weight control in type 2 diabetes management makes it necessary to understand the weight and exercise beliefs and behaviours of the participants. The quotes below may suggest that most SSA do not favour slimness, perceived as suffering poverty, hunger or having a kind of psychosocial and/or physical illnesses or a hidden disease. Bulkiness was perceived as health, wealth and living a good life.

> *"Ah, Africans, if you are not fat, they say there is something wrong. Yea, because they believe that fat*

is evidence of good living. If you are thin, they will say, what is the problem, what's wrong, are you not eating (laughs)" (Participant 6).

"Unless they know that a slim person is rich, they will say that the person is suffering poverty, even when it is known that the person is rich and is terribly slim, they'll say the person is sick. They will say 'this person has a disease, am telling you, there's a disease he has that only him knows about, you know, this life is not perfect for anyone, these rich people.' Women same thing, they will say that there is something she's thinking about that is sucking her blood. (Participant 5).

"Africans, if you are skinny, they say you're hungry, you don't get food to eat, it's true. If you're skinny like me, they think you don't get enough food. Africans think you have to be thick, yea it's true, they think you have to be thick to show you're really ok…" (Participant 7).

Weight beliefs from shared experiences of some slim participants

Below are some shared experiences of living among SSAs as a slim woman. One participant shared how she was castigated when she travelled home to Africa. She shared that she was reprimanded for not looking like her sister who was less slim, an experience she said left her feeling "out of place".

"I mean I was at the airport the other day someone saw me and said 'aah, when I saw you walking, I thought you were a man….you're supposed to look like this auntie you know'… basically that trip I was feeling a bit out of place because I was quite skinny and lanky that trip you know. And everyone did compliment at home 'you look like a man,' common, stuff like that. So, they see you looking a bit masculine when you are too, you know, skinny. (Participant 3)

To say that a woman 'looked like a man' in the African context could have some demeaning connotations ranging from ugly, unattractive and unhealthy.

"That's what am saying, that's the African mentality. The men think that women should be thick. If you are not thick, you're not a woman (laughs). So, you see, I've had friends even in this country who are skinny, and they want to take medications, they want to take medications to have more appetite to eat" (Participant 7).

Beliefs where bulkiness was associated with health while slimness was unappreciated, forced slim individuals to desire to increase weight, while encouraging obese individuals not to engage in weight loss activities. Even among families and friends back home in SSA, the evidence that their loved ones overseas were doing well or not doing well, was if they added or lost weight when they saw them in person or in the picture. This quote shows how parents help to propagate sub-Saharan African's cultural weight beliefs.

"If I go home like this my parents will say, 'oh my God she's suffering, she doesn't see food to eat, she's starving,' or they will start asking me, which one is this? Sometimes I take a picture and send it to my mum, she will start asking me, 'why? Are you having a problem, are you ok? I will say, why,' (she will say) 'you've lost weight" (Participant 7).

Weight beliefs and gender role

In the African context, a skinny married woman without illness could be interpreted as the spouse not meeting his responsibilities, including taking care of the material needs of the wife like food. Such men were seen as poor or stingy. Most well-meaning men were worried when seeing their spouses lose weight, as articulated by this participant:

"What is it, look at bone, chop, baby chop" ('Chop' means 'eat' = Pidgin English). It proves to them that they are taking care of the woman. That 'you no see my money for him body. Yea, I say na my money be that yea' (Pidgin English - meaning - don't you see my money on her body, yes, I say that is my money, yes)" (Participant 6).

These were some of the ways that encouraged a lifestyle of overeating and resultant obesity that helped to propagate the menace of type 2 diabetes among the studied group.

Exercise beliefs and practices

The benefits of exercise in lowering blood glucose are many [33]. The study sought to understand the participants' perspectives on the role of exercise in type 2 diabetes prevention and management. The participants' perspectives and behaviours regarding exercise differed.

"…Exercise hasn't been our thing and forget it (laughs). Aah, sis, what do you want from exercise, we are not, sis hmmm, leave o, if we start, if the doctor advice and we start it, one day, forget it because it's not… Some people try, but because it's not our thing you would hardly see our people do it. Even

some try to do it, but because it's not in our blood" (Participant 6).

"But the only thing, do you know, the best thing for somebody diabetic… the best thing to do is to exercise. If you exercise, if you are diabetic and exercise every day, you won't have diabetes, it will go as far as you maintain it, am telling you, you won't have diabetes. There was a time I tried exercise…, after one week, eh, I couldn't believe my eyes…, even the doctor told me look your own is not high… that if I do exercise that I don't need the medication, that it will just be normal, you understand" (Participant 4).

"I started going to gym when I was sixteen, seventeen so it's just been a part of my life so anytime I don't go I feel like something is missing. So really, it's nothing to do with knowing the fact, what I know now about diabetes I didn't know it about 10 years ago when I started working out. But yea part of the reason why I still do you know, trying to keep fit you know, try as much as I can to stay healthy because you know, I've got diabetes in the family. But not withstanding I will still be, you know going to the gym as much if my family didn't have the history" (Participant 3).

Exercise was recognised by some as beneficial for diabetes control, while for some it was needed to keep fit. Conversely, forming the habit of exercise early in life may have influenced some participants persistence in exercise engagement while discouraging some. The most common physical activities were walking, running and dancing.

"Yea, the only exercise is walk, walking like most of the time, if am going to the town centres is about 20 mins walk, I walk. At least every 2 or 3 days I have to walk, even if am not going to the town centre, I come out and walk around for about 50 mins– 1 hour. That's the only exercise I do" (Participant 9).

"I don't have a problem with exercise, the only issue I have with exercise is my pattern of work. When I come back tired and it might be 5 days or 6 days a week, I don't have the time to go to the gym you understand. But I believe that my walking around at my job and or the train station, I don't know if it is enough, running to meet the bus at the bus stop at the other side, those things happen about 2 times per week, yeah… that's the exercise am doing right now" (Participant 5).

"In the sitting room, you can dance with your children. I like to dance 'Azonto.' When I dance 'Azonto' am sweating because am not going to the gym, I don't have that time, so I always tell my children, 'Let me teach you Nigerian dance,' you know those our fast dance in Nigeria that your body aches". (Participant 1).

Healthcare beliefs and practices

Diagnosing and treating glycaemia and cardiovascular risk factors in diabetes had significant benefits, emphasising the need for the early and frequent use of the healthcare [34], yet this is not the case for SSAs. Some shared reasons for scarce use of check-ups in the UK included, self-medicating, booking appointments which was perceived as stressful than walk-ins in SSA, not forming the habit of medical check-ups early in life in Africa, believe in God as 'our healer', poor recognition of symptoms, denial of diabetes diagnosis, limited diabetes knowledge resulting in poor communication with care providers and subsequent discouragement from inadequate diabetes management and outcomes. SSA immigrants' erroneous beliefs about the use of healthcare were barriers to diabetes management. Regular check-ups in the absence of an illness like diabetes was uncommon, as it was believed to be a way to attract the illness. In illness situations, self-medication was first attempted.

"In Africa we were not used to going to hospital, so we bring such attitude over here. Some Africans here, when they go home, they buy medication and keep in their homes" (Participant 5).

"First of all, our people are not used to booking appointments, we're use to walking in, yea we are used to walking in. You just walk in, and you get seen. And ehm, it's not easily accessible even though they have GPs and all that. You have to go through so many processes, you have to do this and that and that, so most people feel that it's stressful, so they don't even border. I haven't been to my GP for over a year. Is not that am completely healthy, but I don't want to bother myself going through all that" (Participant 7).

"If you don't see any major thing to give you concern, it's not in our way to just go for check-up. People here just, even when there is nothing wrong you say okay every quarterly check-up or monthly people do that. But it's not our thing. So, because it's not our thing even when it's free we are not, until the thing wants to kill you and then you won't get up. So even the free this thing is not enough to say okay I want to go to hospital because it's free, no. It's not our thing. We've always being believing God is our keeper God is our healer…, so it's not our thing" (Participant 6).

"So that is why people are in denial because they don't understand, the awareness is not there and this country too if you don't ask for awareness, you won't get it. They will say, 'you have diabetes do you want to see a dietitian? They will say yes, the dietitian is a white woman, she's gonna say 'eat salad', wetin Nigeria wants to eat salad (what does a Nigerian want to eat salad for), then we go back to our food… So, but if you go to your GP and your mouth is shut, they say 'you blood sugar is high, ok… don't eat too much.' When you get home what do you know they are saying don't eat too much? Is eba and efo, now you are still eating it. So, your blood sugar starts going like that, small time you have stroke, small time you start having headache. So that is our main problem we are in denial…" (Participant 1).

Diabetes diagnoses were either made at the time of treating other conditions or when the situation got to the point of accessing the healthcare through emergency services or after the onset of complications.

"I remember,… this lady use to come every day for wound dressings and she had huge wound, she was diabetes so it wasn't healing… but when she had the wound it was small wound at the beginning, but she ignored it, you know, she waited till it was bad and when she started coming in for dressing, the doctors told her, "this is not going to heal no matter how long it takes because you are diabetic" and she never knew she was diabetic.…they did some test and realize she was diabetic. And the doctors told her it's not going to heal no matter how long it takes. "So, this is what we can do, we can dress it every day just to help keep it clean" (Participant 7).

"I had diabetes when I was 42, during that period…, I was pregnant then I had my son.…I got tired quickly, but I worked… 8 to 8. Your body starts aching at 4 o'clock and you want to finish the shift, so you use… (Menthol) to catch it. If it was not that I had my son maybe I would have collapsed somewhere and I would have died, eeh, but that was how it was dictated because am not a hospital person… So that is why anytime am talking to anybody, I always say make sure when your body is not feeling well, go to your doctor… "(Participant 1).

Sub-Saharan African immigrants' health beliefs and practices warrant their type 2 diabetes management to be culture sensitive and targeted for a good outcome. This suggestion resonates with this story shared by one of the participants who self-identified as living with type 2 diabetes. She shared how she saw her 'consultant' severally without improvement. Then her consultant referred her to a private dietitian accustomed to her culture and diet.

… because my consultant was worried. Am not reducing in weight so he thinks like, okay this salad thing is not going to work.…

According to the participant, after three sessions with the dietitian, her diabetes knowledge increased, she understood healthier ways to prepare her cultural food, and her outcomes significantly improved. According to her, she could not continue to see the private dietitian because she was unable to continue to pay out of pocket.

Perceived diabetes risks

Varied diabetes, diet, weight, exercise and healthcare use beliefs, meanings and behaviours influencing diabetes prevention and control result in poor perceived diabetes risks among participants. There was a range of attitudes to diabetes risks. Some participants argued that with good dietary habit in the absence of family history, it may not be possible to develop type 2 diabetes. Some expressed no serious concern about developing diabetes despite having family history. Some expressed diabetes risks awareness and the desire to prevent the condition. To further understand some of these attitudes to risk, the section below considers the participants beliefs about the impact and seriousness of diabetes.

"Diabetes, I know I don't have the chances of having diabetes, I think am a bit positive, one I know sometimes it runs in the family, we don't have that history in my family so, but then, that notwithstanding, when I am cooking, honestly, anything am doing am very health conscious" (Participant 9).

"Well, no I don't worry I might have diabetes because since I have an idea about how people get it…, sometimes people get it through hereditary, if it is in your family or if you don't eat well, your digestion is not good, you are likely to develop diabetes. I don't have that worry. I had a family member who had it, but it was due to diet, she wasn't managing her diet properly, yea. It wasn't in the family. Like she had it through her, should I say her eating habits, yea". (Participant 7).

"It's not something that is always lingering in my head. Is not something that am scared about, not at all" (Participant 3).

"…Yes, I do, because my mum and my dad are diabetic, so yes, I do worry about diabetes. Why I actually made an effort to lose weight was because I saw

my dad deteriorate you know, because of diabetes in fact that was what led me to, not like I wasn't using the gym I was using the gym, but what made me become so serious in my weight loss programme was because of my dad's health" (Participant 11).

Perceived diabetes severity

As well as poor risk perception, perceived severity was also poor despite the widespread encounter and experiences with diabetes. Diabetes symptoms and complications were not recognised other than wounds that refuse to heal. Some did not consider diabetes as a serious condition. These findings are significant for a group that did not have regular check-ups. Nonetheless, through constant publicity, diabetes awareness is raised as expressed by the last participant.

"So it's not as serious as cancer when somebody hears cancer the way cancer is snatching people's lives now, so when you hear cancer you think okay that is a serious illness now because you hear that it's taken lives but maybe because I have not heard that 'someone died and diabetes killed him or her', maybe that's why I felt it's not serious (laughs), really, I've been honest" (Participant 6).

"I had a neighbour, she had diabetes when she was told she had diabetes, I mean it's like a death sentence to her. She felt so bad but for me, maybe because I've seen worse, but for me I don't think it's that bad". (Participant 9)

"Diabetes eh, just recently maybe because of the constant publicity about it that I am taking it a bit more serious, before I didn't take it that serious. I believed it is old age sickness, it wasn't one of the old age sicknesses I was dreading that it should not come, yea. But because of the awareness, am starting to give it a thought" (Participant 5).

Discussion

Ethnic minority groups in developed countries, including Blacks in the UK are worse hit with type 2 diabetes [35]. Blacks develop diabetes at a younger age than their host counterparts [1] and suffer worse complications leading to higher morbidity and mortality [5, 36]. Limited studies on African immigrants, (especially those from Nigeria, Ghana, Kenya and Somalia whose populations have grown significantly in the UK [37] indicate that they are significantly affected by higher prevalence of type 2 diabetes [38]. The alarming global diabetes rise, the future predictions and the vulnerability of SSA population mean that their perceived diabetes knowledge, risk, severity and barriers to diabetes prevention and management, and attitudes regarding diet, weight, exercise, and healthcare need to be understood and used to structure targeted programmes to enhance their diabetes care. To date, no UK study exists that has explored SSA immigrants in this respect, making this study essential. Four major themes were generated from the data which include, 1). Perceived Diabetes Knowledge and Meanings, 2). Diet, weight, exercise and healthcare use beliefs and behaviours, 3). Perceived diabetes risks, and 4). Perceived diabetes severity.

All participants had some experience with diabetes. Two participants self-identified as persons living with diabetes mellitus, confirming the high incidence and prevalence of type 2 diabetes among SSA especially those in diaspora [39], including the UK [40].

Diabetes knowledge

Despite high incidence and experience, diabetes awareness was notably poor among participants. Many stated they did not pay much attention to diabetes. In other studies with African Americans and other ethnic minorities in the US, expression of diabetes experience was also found, but knowledge about risk factors and susceptibility was deficient [41–43].

Diet

The study participants' food and snacks were carbohydrate rich. High carbohydrate cultural diets like 'fufu' (swallow), prominent among Nigerians and Ghanaians, were considered nutritious and of better quality as was also identified by [44]. The quantity, quality, and preparation methods of carbohydrate rich diets determine the potential impact on type 2 diabetes [45]. Participants believed that natural methods of food cultivation, preparation and preservation back home provided better quality and healthy diets that did not make them sick in Africa. Brown et al. [46], studied African-Caribbean people with diabetes who shared that their traditional foods back in the Caribbean were natural and healthy though high in starch. Higginbottom [47] documented that African immigrants perceive their diets as better quality than western diets. Based on these beliefs, willingness to adopt other diets was not evident in this study. Statements like, *"that's not our thing…" "We are not used to that…", "that's not the way we were brought up"* were common justifications for such behaviours. Cooper Brathwaite and Lemonde [48], also found that African immigrants in Canada preferred their mostly starchy cultural foods over other types of foods. Brown et al. [46], note that Africans adhered to their cultural diets and their perception of cultural foods as quality and healthy may act as a barrier to adopt recommended dietary behaviours for type 2 diabetes control.

Weight

Obesity is a predisposing factor to type 2 diabetes [49] and cardiovascular disease [50, 51],. Weight reduction can prevent or delay type 2 diabetes in a non-affected obese individual, prevent or delay complications in already affected persons and can reverse the condition [52]. So, understanding weight and exercise beliefs and behaviours is important. Weight control is the most difficult of all modifiable factors [53] and may add to most illnesses and death globally [54]. Yet, the present study highlighted that African tradition considered obesity and overweight as evidence of living a good life. Even among the few participants who argued that SSA immigrants no longer see weight as evidence of good living, their choices still tended towards obesity when asked to state their ideal body sizes. Some slim participants discussed their unpleasant experiences of being slim among a cultural group that frowned on their size and constantly questioned their wellbeing. Similar studies [55, 56], found overweight as more desirable and an ideal for women [57], while slimness was associated with having HIV/AIDS, TB and/or cancer or said to be caused by physical stress or depression resulting in poor eating habits. Thus, obesity and overweight were not implicated by many as capable of causing type 2 diabetes [43, 55–57]. SSA immigrants in Europe have a high incidence of obesity and diabetes [39] with diabetes risk two to three times higher than the indigenous European population [38]. Obesity is also significantly associated with developing type 2 diabetes [58, 59], while weight loss in persons living without diabetes helps to prevent type 2 diabetes and may delay or prevent the development of complications in diabetes diagnosed persons [53]. Those that perceive the risk of being affected by diabetes due to obesity are significantly more likely to pursue losing weight than those that do not [60],. These erroneous weight beliefs, cultural acceptance of overweight and efforts to maintain culturally acceptable size may be barriers to adopting healthy behaviours that required weight loss [61].

Exercise

Physical activity is recommended for diabetes prevention [62, 63], and with adequate diet, chances of developing type 2 diabetes is reduced in high-risk individuals [64]. While only a few participants in this study connected exercise with diabetes management [43, 65],, most were involved in some form of physical activity at varied frequencies that included walking, running, dancing and hardworking. Dancing can enhance the metabolic processes and health outcomes of the elderly as well as help them to develop strength, flexibility, better movement coordination and balance, for improved physical health [66]. Most of the participants considered working hard at their jobs as exercise. In Nigatu et al. [67], about 50% of the participants' physical activity were work related as opposed to 6.3% for recreational exercise. In this study, only one participant was actively involved in structured exercise. Some reasons for lack of routine exercise were limited time, lack of motivation and social support, laziness and tiredness even when exercise machines were present in the home.

According to the UK Chief Medical Officers' Physical Activity Guideline [68], exercise is encouraged for those 19 to 64 years of age no matter how minimal, which qualified some of the observed and shared exercise forms as efforts in the right direction. However, effective, targeted physical activity should involve 150 min of moderate intensity exercise per week or 75 min of more intense exercise or engaging in highly vigorous activities for shorter periods of time or a combination of the three. Based on the recommendations, most of the participants were not getting enough hours of weekly exercise. Cooper Braithwaite and Lemonde [48], also found that the participants in their studies had fewer hours of weekly physical activities.

Healthcare use

Healthcare use among the sample was poor. Seeking health services was usually a last resort after other methods of care such as self-medication with traditional and/or allopathic medicines and consultation with spiritual leaders were exhausted. Some reasons given for delayed healthcare use were, trust in God as 'our healer', costs, perception of being healthy, denial of their illness diagnosis, not used to going for check-ups in the absence of an illness back in Africa, having to book for General Practitioner (GP) and hospital appointments as opposed to walk-ins in most SSA countries, waste of time, and delay in being seen by the GP. Other reasons were not being taken seriously by the healthcare providers, and the belief that orthodox medicines have side effects. Lack of trust in the care providers who may give confusing and hard to follow dietary advice that did not consider the traditional diets of the population, and the complexities in accessing the healthcare system.

Other studies have outlined similar findings. For instance, Brown et al. [46], found that Caribbean participants perceived their traditional medicines to be more effective than western medicine. Ethnic minority groups have difficulty accessing primary care services and have unmet healthcare needs with the current healthcare system [40]. In their study with South Sudanese immigrants in Melbourne, Yeoh et al. [69], identified that participants expressed confusion with the healthcare system, frustration with the appointment system and complained about delays in the emergency services. Cultural insensitivity in providing healthcare services, limited community-based healthcare services and limited clinic-based interpreters

have been blamed, while poor perception of susceptibility, severity, benefits and consequences of diabetes complications could also hinder seeking timely intervention [69, 70]. In Mann et al., [42] study with low-income minorities in the US, the participants expressed fear of addiction to blood sugar medicines which they also complained was hard to swallow. Denial and not wanting to gain knowledge about diabetes were deliberate efforts that the participants in Wallin & Ahlström's [71], study with Somalis immigrants living in Sweden used to forget the diagnosis. Most SSA trust their Pastors, even with health-related issues than healthcare practitioners [72].

Perceived risk

Limited understanding of type 2 diabetes aetiology and severity could affect perceived susceptibility as was apparent in this and other studies [73, 74]. Some participants believed they could not develop diabetes because they had no family history, implying that genetics and hereditary could be the only risk factor. In the absence of a health problem, the perceived risk for a condition is limited [75]. Not seeing self as vulnerable to developing diabetes makes it difficult to embrace habits and attitudes that would help in its adequate prevention and management [76, 77].

Perceive severity

Most participants thought diabetes was not as serious as cancer, HIV/AIDS or any severe infectious diseases. In another study with SSA migrants in Australia [55], some participants did not pay much attention to diabetes because they considered HIV/AIDs to be more serious. Limited understanding of the impact of diabetes resulted in failure to associate diabetes symptoms, complications and outcomes with the condition, translating into the attitude that one could live a normal life even after being affected and need not worry, as identified in other studies [71, 78]. Only two participants perceived diabetes as serious. One self-identified as living with type 2 diabetes with family history who witnessed unprecedented diabetes related complications and deaths among family members and had numerous medical exposures to diabetes management due to her own diagnosis. Another participant had witnessed diabetes related devastation and death of her parent. These subjective diabetes perceived meanings and non-seriousness by some participants influenced their attitude towards lifestyle behaviours required to prevent and self-manage the illness.

Limitations

Although participant recruitment involved the use of culturally targeted strategies, it was difficult to recruit immigrants from other countries of SSA. Only those from Nigeria and Ghana participated in this study and there were fewer men than women. Consequently, some findings may not represent the perspectives of the other immigrants from other countries of SSA and/or that of all SSA men. Nonetheless, similar studies conducted elsewhere involving immigrants from other countries of Africa show similar findings. Generalising the findings may be hindered by the small sample size. However, this study sought to understand human behaviour by observing and interviewing a few participants for an extended period. Besides, data collection reached saturation.

Conclusion

Individuals are likely to adopt healthy behaviours to prevent the likelihood of a condition like type 2 diabetes if they perceive that they are vulnerable/susceptible and the consequences of having the condition are severe. Also, if the alternative behaviour like adopting evidence-based healthy lifestyles is perceived to be beneficial and highly likely to protect them from developing type 2 diabetes and if barriers to adopting the healthy behaviour is perceived as low [79, 80]. By highlighting SSA immigrants' diabetes awareness, diet, weight, exercise and healthcare beliefs and behaviours, this study has shown that their diabetes perceived risk and severity are limited while their perceived barriers to adopt and engage recommended lifestyle behaviours to prevent or safe managing type 2 diabetes in the affected individuals are daunting. This explains the reason for the high incidence of type 2 diabetes among SSA in the UK. Consequently, understanding type 2 diabetes perspectives and lifestyle behaviours of the high-risk SSA immigrants in this study, makes considerable theoretical and methodological contribution to the existing wealth of diabetes knowledge.

Recommendations for practice

- Diet is relevant for diabetes control. Because SSA immigrants love their cultural cuisine, treatment, programmes and education targeting positive diabetes outcome should incorporate dietary changes that are more culturally sensitive, shown to produce result [81].
- Due to diversity in healthcare UK, 'Healthcare matching' where SSA immigrant patients are referred to health providers and dietitians who understand their cultural lifeways may be eminent. This may ensure that education about the best food alternatives, preparation methods, portions sizes, weight control, exercise and needs for regular check-ups is better communicated. Patients can also make private inquiries about providers or dietitians that offer culture sensitive diabetes managements and request to be referred by their current health

providers. Research is needed to evaluate the cost effectiveness of 'health matching'.

- Private consultations with providers and dietitians offering individually tailored, targeted and culture sensitive teachings that are capable of increasing diabetes knowledge, better management and desirable outcome may be expensive and should be subsidised.
- Since most SSA immigrants trust their Pastors with health-related issues more than their healthcare practitioners [72], diabetes awareness, prevention and self-care education could take place as after church programmes and in community centres so that family support for high risk or affected family members may be solicited. Pastors and spiritual leaders should be involved in educating their members about diabetes prevention and control. Studies that explored the use of faith based diabetes interventions showed significant results in adequate diet, physical activities, weight management, fasting blood sugar and body mass index (BMI) [82, 83].
- The UK is highly commended for importing overseas food to augment its food production partly due to climate. However, consideration should be given for increased trade agreements with SSA countries like Nigeria and Ghana whose population is growing in the UK, and who are at high risk for type 2 diabetes, who also expressed dissatisfaction with the current available produce as the findings portray. Finally, if possible, future studies in the UK for this population, should endeavour to include more participants from SSA countries and more males.

Abbreviations

SSA Sub–Saharan Africans

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Authors' contributions

Author contributions LO collected and analysed dataPD and JS extensively reviewed data analysis and interpretationJS substantially revised the work.All authors adequately addressed and resolved disagreements. All authors read and approved the final manuscript.

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Data availability

The authors confirm that the data generated or analysed during this study are included in this published article.

Declarations

Ethics approval and consent to participate

Ethical approval was obtained from the Research Ethics Committee, School of Health and Social Work, University of Hull. Plans were made to provide support if a person with diabetes became unwell during the study, became emotional, needed more information about diabetes or were worried about experiencing symptoms or powerlessness over their diabetes control or that of their family member. Those who agreed to participate were met at convenient venues, dates and times. Detailed information was given regarding the study. It was explained that the observation and conversational interviews could be demanding and uncomfortable especially when conducting relevant activities with the researcher present. Enough time was given for potential participants to ask questions about the research. The decision to participate was entirely theirs without coercion. They also knew they could withdraw from the study at any time if they changed their minds without consequences. Potential participants were given information sheets and consent forms containing in-depth information and were given 2 to 5 days to think through their decisions to participate. Informed consent to participate was obtained from all the participants in the study before data collection began. Confidentiality regarding any information given was assured and data was held securely and solely used for this study. Our study adhered to the Helsinki declaration of conducting research involving humans. This study belongs to Staffordshire University.

Consent for publication

'Not Applicable'.

Competing interests

The authors declare no competing interests.

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