

RESEARCH ARTICLE

Decolonising and democratising Malawian public health

McDonald W. Nyalapa, Cath Conn and Shoba Nayar

Abstract

Introduction. Transformative public health must move from its historically overly Eurocentric and professionally driven orientation towards local-contextualised, community-based health, empowerment and co-design of health research. As in many Pacific nations, Malawi is experiencing changes in its food systems which have health implications for the Malawi people. This study sought to democratise and 'open up' the exploration of family eating through a photovoice collaboration with Malawian families with a view to understanding the links to a newly emerging and serious public health problem - diabetes.

Methods. This photovoice study involved four families located in a semi-rural district of Blantyre, Malawi. Images were collected using phones by younger family members to create a photo food diary of breakfast, lunch, and dinner eaten in the home. Using the photos as a prompt, focus group discussions were undertaken with each family exploring past and current eating patterns, and eating concerns for health.

Results. Thematic analysis of the photos and focus group transcripts revealed that staples, such as maize and sorghum, are still important in family eating. However, there is a worrying increase in consumption of obesogenic processed foods such as sweetened beverages and snacks.

Conclusion. Malawi is currently experiencing a 'nutritional transition' brought about by commercialisation of food and the growing threat to a sustainable and healthy food system from climate change. Drawing on indigenous wisdom, this study argues that co-designed research methodologies, such as photovoice, are necessary to empower communities' collaboration in shaping issues of their own health.

Keywords: public health, photovoice, diabetes, nutrition transition

Introduction

Diabetes mellitus, or diabetes, continues to impose health and socioeconomic burdens both on developed and developing nations. Diabetes is a serious, chronic noncommunicable disease (NCD) which occurs when the pancreas produces insufficient insulin - a hormone that regulates blood sugar - or when the body cannot effectively use the insulin it produces (World Health Organization [WHO], 2016). Globally, there are 463 million people living with diabetes, a figure projected to reach 700 million by 2045 if no prompt action is taken (International Diabetes Federation [IDF], 2019). Type 2 diabetes mellitus (T2DM), which occurs when the

body ineffectively utilises the insulin it produces, is the most commonly occurring type of diabetes worldwide (Wang et al., 2019). T2DM is driven by a wide range of factors and accounts for the vast majority of people living with diabetes, particularly in developing regions, such as the Pacific (Foliaki & Pearce, 2003) and sub-Saharan Africa (Pastakia et al., 2017). This study focused specifically on T2DM in Malawi.

Sub-Saharan Africa is a region that has been hardest hit by various pandemics, such as HIV and AIDS (Nyalapa & Conn, 2019). It is also a region with widespread poverty and constrained healthcare resources amidst increased rates of NCDs, such as diabetes and cardiovascular diseases (Atiim & Elliott, 2016; Pastakia et al., 2017). It is projected that NCDs will account for about half of all deaths in sub-Saharan Africa by 2030 (Price et al., 2018). T2DM, which was a rare disease in sub-Saharan Africa, is now well grounded in the region (Motala et al., 2022) and has started to impose substantial public health burdens on Malawi and other sub-Saharan African countries in the last decade (Msyamboza et al., 2014; Pastakia et al., 2017). Population-based studies conducted in Malawi have revealed both a high burden and a steadily increasing prevalence of diabetes over the past decade (Msyamboza et al., 2014; Price et al., 2018). Further, these Malawian studies have identified a wide range of factors, such as dietary changes, nutrition transition (Thakwalakwa et al., 2020), physical inactivity, and rapid urbanisation as key drivers of T2DM (Msyamboza et al., 2014; Price et al., 2018).

Nutrition transition, a key driver in the rise of T2DM, is defined as dietary changes associated with shifts in body composition and nutrition-related disease in countries undergoing economic and social development (Nnyepi et al., 2015; Popkin, 2015). Nutrition transition started to occur following World War II when the global food system began to focus on cash crops such as sugar cane, palm oil, and sourced food from animals fed with grains, as well as monocultures of grains to meet the global dietary needs (Popkin, 2015; Zucali et al., 2018). Additionally, commercialisation and industrialisation has resulted in increased processing of food (Nnyepi et al., 2015). Plant-based foods have dominated African diets for decades, with the addition of small amounts of locally sourced animal proteins (Haggblade et al., 2016). Thus, sub-Saharan Africa has come late to an accelerating worldwide nutrition transition.

Although nutrition transition has been identified as a driver of T2DM in sub-Saharan African countries (Haggblade et al., 2016; Pisa et al., 2018; Steyn & Mchiza, 2014), comprehensive research on dietary patterns that might be influencing diabetes is limited. This is partly because NCDs, such as diabetes, are considered emerging epidemics, whereas much of the research in Africa has focused on infectious diseases (Pastakia et al., 2017). However, this

focus must change if the effects of nutrition transition and T2DM are to be combated in nations such as Malawi.

Historically, global public health measures to combat NCDs have been based on an overly Eurocentric and professionally driven legacy of human health science thus, limiting its effectiveness (Affun-Adegubu & Adegbulu, 2020). Research has been traditionally positioned in a homogenous 'medical model' of public health, yet researchers and practitioners are now faced with the realisation that for effective change in health systems to occur, public health approaches need to be decolonised and democratised. This novel approach involves changes at both epistemic and ontological levels, as well as the methodological level that places importance on local-contextualised, community-based health; empowerment and co-design of health research and actions; drawing on indigenous wisdom and diverse health concepts; and reflecting a priority for the health of people and the planet. This small-scale qualitative study aimed to explore and understand the specifics of what families in Malawi are currently eating and how this might be linked to the risk of developing T2DM. Using an innovative visual method, photovoice, the visual aspects of the food Malawian families eat were captured and used as a focal point for initiating discussions to elicit their opinions and experiences of changing eating patterns. Such knowledge is crucial for developing unique prevention strategies and contextually specific policy (Pastakia et al., 2017; Pisa et al., 2018).

Methods

Photovoice, a form of community-based participatory research methodology, was used to explore families' eating patterns and experiences. According to Wang and Burris (1997), photovoice is a "process by which people can identify, represent, and enhance their community through a specific photographic technique" (p. 369), thereby producing knowledge in a visual format which offers another dimension of understanding compared to conventional research methodologies (Jurkowski & Paul-Ward, 2007). Photovoice was used because it democratises the research process and engages participants as co-researchers rather than subjects (Castleden et al., 2008; Novak, 2010; Novek et al., 2012). In the same vein, participants assume control over what matters in their lives, hence promoting a sense of empowerment (Jurkowski & Paul-Ward, 2007).

Although photovoice has been successfully used in health and illness research (Creighton et al., 2017), it suffers ethical issues, namely invading people's privacy; potentially disclosing embarrassing facts; and the risk that photographs may be used for commercial purposes (Martin et al., 2010; Novek et al., 2012). As such, photovoice researchers are obligated to ensure that research with communities respects the communities' collective wisdom and

expertise (Liebenberg, 2018). Moreover, researchers must take necessary measures to address any ethical concerns. In this study, only photographs of food were collected, and it was emphasised that no human photographs or any photographs with personal identifications would be allowed. In addition, a succinct, separate consent form outlining how the pictures would be used was discussed with study participants prior to the commencement of the study. Furthermore, a plan of measures to ease the practical mechanics of using smartphone cameras was submitted for ethics approval.

Photovoice can also be expensive and time-consuming, similar to some longitudinal studies (Novek et al., 2012). This is because a lot of investment goes into purchasing photography devices and orientating participants on the use of the camera. This study utilised second hand smartphones to minimise the costs and ensure effective communication with the participants. Camera orientation was done at a family level to save time. Despite the costs, when proper attention is paid to ethical issues and the practical mechanics of using a camera, photovoice can provide researchers with a unique opportunity to tap into participants' physical and social contexts.

Lastly, there is a concern that the engagement of people in a democratic knowledge production process waters down the rigour of the photovoice method (Gubrium & Harper, 2016). However, it is important to note that photovoice remains a rigorous knowledge production process that supports and results in theoretical advancements contributing to larger bodies of knowledge (Chevalier & Buckles, 2013). The key to the successful execution of this method is to ensure that selected research tools are effectively used to maximise the authenticity of the data collected (Liebenberg, 2018).

Ethics

Ethics approval was obtained from the Malawi National Health Sciences Research Committee, 5 April 2017, no. 1759; and the Auckland University of Technology Ethics Committee, 10 March 2017, no. 17/13.

Setting

The study took place in the semirural area of Blantyre district in Southern Malawi. Blantyre was chosen because it is a target for sprawling food markets in Malawi (Nnyepi et al., 2015). Furthermore, the study focused on the semirural population because about 85% of Malawians live in rural and semirural areas (World Bank, 2019). The taking of pictures and recording of food diaries took place in the homes of the participating families.

Participants

Four Malawian families residing in the semirural area of Blantyre district were recruited. Inclusion criteria included families with at least five members (at least one or two adults aged above 40 years and children aged 10 years and older). The families were recruited on a first come first served basis, on the principle that they would be willing to participate in photographing their meals and in family focus group discussions.

The initial call for families to participate in the study was made at a local church because this is a gathering place for community members in the semirural areas of Malawi. In addition, posters and recruitment notices were pasted on trees and notice boards in the local area. Prospective families were asked to communicate with the researcher (the first author), whose contact details were given on the recruitment poster. Upon expressing interest to participate in the study, each family was paid a preliminary visit to discuss activities involved in the study. Following these visits, four families were recruited (see Table 1). Four families were considered to be an adequate sample because this was a small-scale study.

Family number	Name	Role	Age (years)	Education level
Family 1	Mase	Parent	50	Primary school drop-out
	Wako	Parent	30	Secondary school drop-out
	Miranda	Child	20	Secondary school drop-out
	Kondwani	Child	18	Secondary school student
	Talandira	Child	15	Primary school student
	Chikondi	Child	11	Primary school student
Family 2	Ulemu	Parent	35	Secondary school drop-out
	Mutu	Parent	30	Primary school drop-out
	Sarah	Child	17	Secondary school student
	Gift	Child	14	Primary school student
	Mphatso	Child	12	Primary school student
Family 3	Moses	Parent	45	Secondary school drop-out
	Lara	Parent	38	Primary school drop-out
	Bob	Child	20	Secondary school student
	Maya	Child	14	Primary school student
	Zanga	Child	10	Primary school student
Family 4	Ulendo	Parent	50	Secondary school drop-out
	Wani	Parent	40	Secondary school drop-out
	Mega	Child	21	Secondary school student
	Ufulu	Child	15	Primary school student
	Noma	Child	15	Primary school student
	Tinyade	Child	10	Primary school student

Table 1. The participating families

Data collection

The primary investigator utilised the participatory nature of photovoice to engage families in photographing their daily meals and participating in focus group discussions in their everyday environment. Therefore, the participating families acted as co-researchers of what foods they were eating every day and their opinions on current eating patterns. Data included photovoice sessions, food diaries, and focus group discussions.

Each participating family was asked to photograph the food they ate for a period of 4 days. Families were requested to take pictures of their main meals and snacks using the provided smartphones. Prior to data collection, the researcher convened a meeting to ensure that all participating families were comfortable as co-researchers and familiar with how to use a smartphone camera. At this meeting, the co-researchers' responsibilities and expectations were discussed to ensure no one was harmed or made to feel uncomfortable during the process. Attending to issues of ethics and safety is imperative in photovoice methodology (Sutton-Brown, 2014; Wang et al., 2000).

In addition to photographing their food, co-researchers were asked to concurrently complete food diaries, documenting the food eaten and its basic ingredients, such as salt and cooking oil. Taking photographs is a participant-empowering process but it is the reflective activities, such as journaling, that help tap into personal and social issues that may be overlooked by other conventional research methods (Novek et al., 2012). Co-researchers compiled these journals (food diaries) and shared them with their family members.

At the end of the photography period, food pictures and diaries were collected and a focus group discussion was organised with each of the families. The sharing of pictures is a crucial step in photovoice because it prompts dialogue (Sutton-Brown, 2014). Although images are a powerful representation of a topic, it is the accompanying dialogues that have the potential to tap into participants' strengths and emotions (Hergenrather, 2009). Each focus group discussion lasted about 90 minutes and was digitally audio recorded. The discussion provided an opportunity for participants to talk in-depth about their eating patterns and how these patterns have changed over time. The depth of the focus group discussion was evident in the ways in which participants reacted to the food pictures and extensively explored their eating patterns. This resulted in the generation of rich data.

Data analysis

In preparation for analysis, photographs were printed from the smartphones and recordings of the focus groups were transcribed verbatim. Photographs and focus group transcripts were

organised separately to minimise coding challenges (Chapman et al., 2017). The authors employed thematic analysis to analyse the data collected. Thematic analysis is a method of identifying, analysing, and reporting patterns within data (Braun & Clarke, 2013). This analysis allowed the authors to identify and analyse themes from both the pictures and the discussion transcripts. The data analysis followed these steps. First, copies of food pictures, focus group discussion transcripts, and field notes were made. Next, transcripts were closely read in relation to photographs to understand the context. At this point, descriptions of the food in the diaries and transcripts were matched to the relevant photo. Photos were analysed for the types and amount of food shown. Codes for each photograph were then linked back to coded text analysing the relationship between the data. Working across data sets, the next step involved grouping key words into themes and then making connections between themes (Braun & Clarke, 2013; Murray & Nash, 2017) until all data were accounted for and themes were sufficiently saturated.

Results

Presented here are two themes that emerged from analysis of the photos and focus group discussions: 1) The food people eat; and 2) Opinions on current eating patterns.

The food families eat

Carbohydrates formed the bulk of the food consumed during breakfast. The most common energy sources ranged from simple, refined sugar and white bread to complex carbohydrates, such as sweet potatoes and soya porridge (see Figure 1).

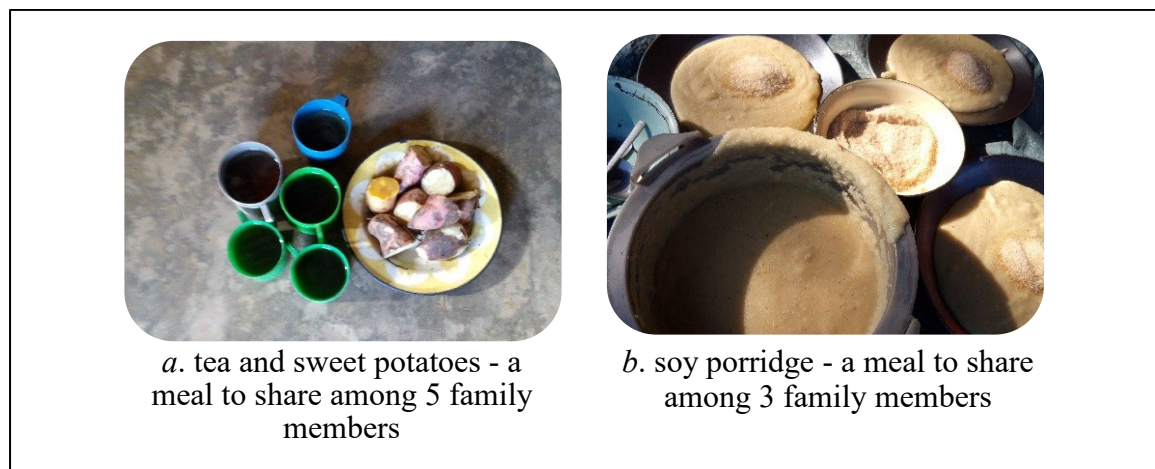


Figure 1. Breakfast foods

Tea was the most common drink for breakfast. Tea and porridge are consumed with sugar in Malawi. This is not a surprising finding as sugar consumption has been increasing in Malawi since the 1990s (Taulo & Sebitosi, 2016). It is a common practice in Malawi to add sugar to the whole tea or porridge pot, as this is considered economical. Focus group data revealed that choice of breakfast was based on the availability of sugar. Wako (Family 1) described how the availability of sugar determines the number of tea cups she drinks:

It all depends on the amount of sugar available. If we have enough sugar I can take two to three cups of tea in the morning. I can only take one cup if we are running low on sugar. We usually do not take tea in the afternoon because of the same issue of sugar.

Similarly, they added about three tablespoons of sugar to each plate of soya porridge.

As with breakfast, carbohydrates - mostly nsima - constituted three quarters of the total lunch meal consumed; only two meals were comprised of rice and fried potato chips. Figure 2 illustrates the food that constituted lunch.

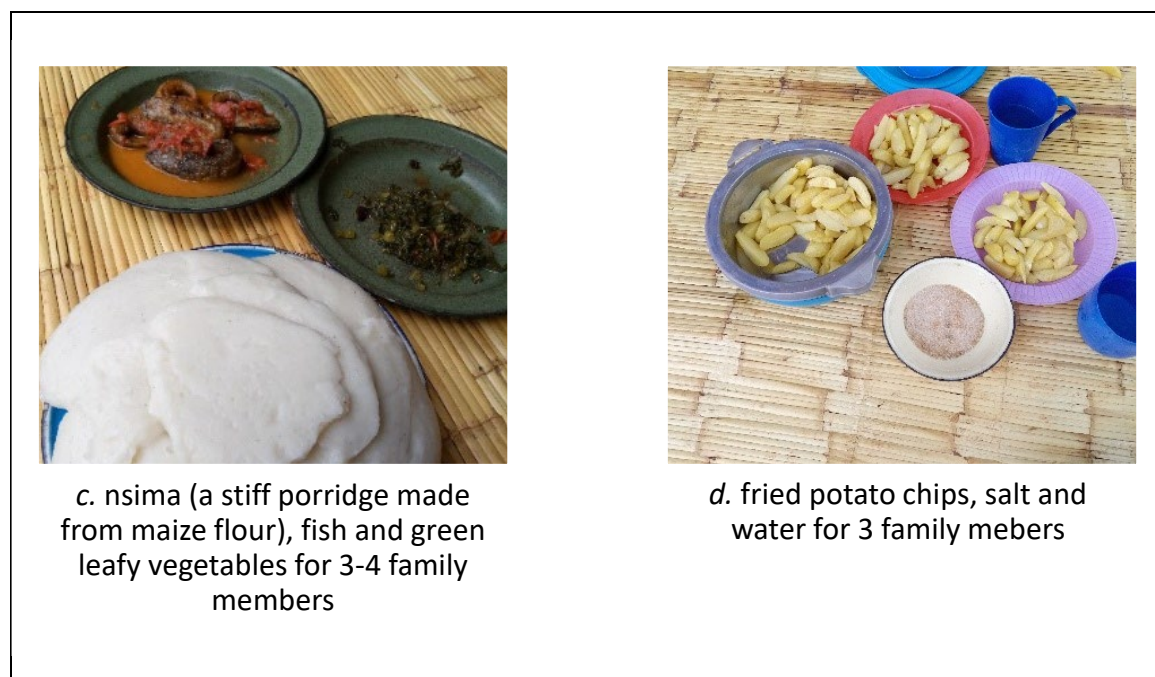


Figure 2. Lunch foods

Nsima is a stiff porridge made from maize flour (Lunduka et al., 2012) and consumption of this local staple among family members was very high, representing one of the highest intakes of calorie-dense foods. Its popularity in Malawi is primarily driven by the fact that nsima is stiff in

nature and satisfies people faster than other food options, such as rice. Ulemu (Family 2) explained:

The work we do here in the village is mostly physical, such as gardening so it makes us feel very hungry. One of the foods that satisfy us is nsima because it is heavier than other foods and you can feel it in the tummy. When I take three to four portions of nsima, I feel strong enough to do my daily farm work

Cooked green leafy vegetables, animal-based protein and legumes formed the relish for nsima. In Malawi, relish is similar to a sauce or stew prepared from boiled legumes, vegetables, or meat/poultry or fish/eggs (Ferguson et al., 2004). It is a common belief among family members that good relish influences them to eat more nsima.

I normally take three to four pieces of nsima depending on the relish we have on that particular day. If it is good relish like meat, I can take up to four portions of nsima; if it is with vegetables or other regular relish like beans, I just take two or three portions. (Ufulu, Family 4)

Supper was the last main meal the families ate before going to sleep. As with lunch, nsima was the most common carbohydrate-containing food consumed by the families (see Figure 3).

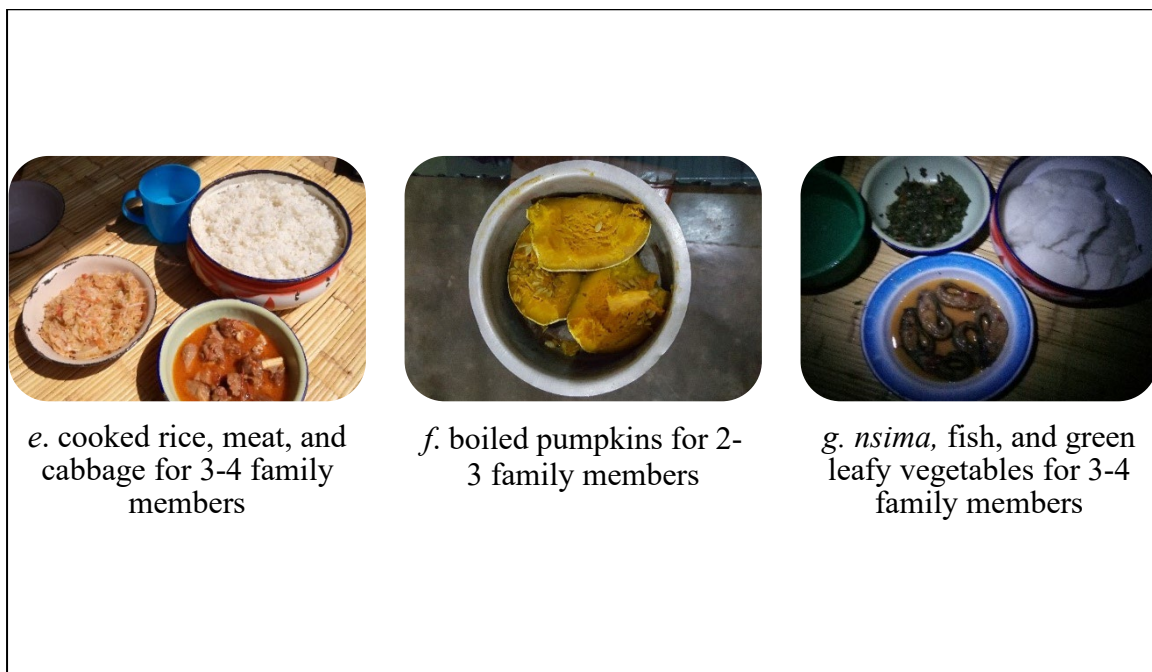


Figure 3. Supper foods

Alternative energy sources included rice, boiled pumpkins, bread, and sweet beer - a traditional non-alcoholic drink prepared from maize, millet and sorghum, usually taken with

sugar. Family members had mixed perceptions regarding the choice of food for supper. While some opted for nsima, others ate it due to lack of choice. Alternative foods were deemed too costly and therefore, saved for special occasions.

We usually take nsima again before going to bed unless it is a special day like Christmas or Easter... Well, if we have a visitor and has brought us some food like rice, that's when we taste it. Otherwise it's not easy to get. It is one of our delicacies here.
(Maya, Family 3)

A snack is any food taken between main meals or when a person feels hungry outside of the three main meals - breakfast, lunch, dinner. Figure 4 illustrates the snacks captured by the families.



Figure 4. Snacks

Seasonal fruits (e.g., mangoes, avocado pears, oranges, bananas) were favoured snacks; however, mostly families ate whatever was available. Talandira (Family 1) commented:

I mostly take bread or whatever is available as a snack, mainly leftovers from breakfast. It also depends on the season; if it is a season of fruits, such as mangoes, we eat such fruits. Generally speaking, we eat whatever is available.

Most family members preferred eating something light to avoid interfering with the next main meal (see Figure 4). Gift (Family 2) stated:

I love taking Kamba puffs, soft drinks like coke, jiggies or biscuits in the morning as I await another main meal, such as lunch. I like taking something light because I want to keep space in my tummy and avoid interfering with the next main meal.

Opinions on current eating patterns

Families voiced that current food patterns are different from what people used to eat two decades ago or more, with traditional food gradually being replaced.

I strongly think the food we eat nowadays is different from what we used to eat in the past. ...I have seen eating change over time. Most of the local foods, such as wild greens, are nowhere to be seen. What you see out there is just modern food; maybe it is replacing the old food. (Mase, Family 1)

Traditional food was criticised for providing a limited source of nutrients. Mutu (Family 2) noted that the food they ate seemed to belong to several food groups; equating to good health.

I think the food we have been eating as a family these days belongs to a wide range of food groups. We are eating different food stuffs, such as fish, Irish potatoes, tomatoes, chicken and many more unlike in the past when we were just obsessed with nsima and beans. This is a good thing because it contributes to our good health.

Before taste, looks are what attracted people to food. The findings suggest that current food is beautiful, attractive, and appetising unlike traditional food options. Moses (Family 3) explained:

I think the food we eat these days looks and tastes good. You can easily tell that there are nice ingredients in there; if it is relish, you can see tomatoes and cooking oil there (laughs). So yeah, the food is attractive and tasty. This is quite different from the local food we have been eating before; just food but not really attractive.

Although current food is perceived to be tasty and attractive, it requires excessive use of ingredients, such as cooking oil, salt and other spices which are believed to be harmful to the body. Maya (Family 3) commented:

I think we have gone way too deep into modern ways of cooking. I can say that we have lost our usual ways of cooking and embraced modern techniques. As you can

see on the pictures, these days we like eating food with a lot of oils and spices. In the past, we were just boiling our relish... nowadays, we are frying almost everything.

Other family members observed that people nowadays are more inclined to consume ready-made food from the market.

I think people have less time to prepare their own food than before; they would rather spend their time on entertainment than in the kitchen. People these days like to buy ready-made street food and food from restaurants. This is a problem. (Mase, Family 1)

Family members had conflicting thoughts regarding modern food. On the one hand, such food was largely perceived as attractive and delicious; on the other hand, participants believed modern food to be full of chemicals used as part of crop production.

I think the food we eat nowadays is different from the food we were having in the past. In the past, crops like maize and vegetables were just being grown without applying fertiliser. Nowadays, we apply fertiliser. In addition, we harvest the maize and bring it home only to apply chemicals to protect it from pests like weevils. Almost everything is being treated with chemicals, which I think is dangerous. (Talandira, Family 1)

Similarly, Kondwani (Family 1) shared her views regarding the use of chemicals in animal husbandry:

These days everything is being treated with chemicals. I will give you an example of chickens. I heard that people give chicken drugs to make them grow faster. You can imagine a chick being ready for consumption in just six weeks because it has been given doses and doses of drugs. In the past, we were just growing our own chickens and fed them local maize and flour.

Discussion

This study set out to investigate current eating patterns among Malawian families to see whether these might be contributing to the risk of T2DM. The study revealed emerging dietary patterns among semirural Malawian families, such as increased sugar intake; consumption of processed snacks and sugar-sweetened beverages; and eating outside the home; all of which are associated with obesity pandemics and a substantial risk for noncommunicable diseases such as T2DM.

This research recorded, for the first time, food semirural Malawian families eat for breakfast, lunch, supper, and snacks. Tea drinking and soya porridge were central to breakfast, with the availability of sugar a key determinant of what and how much to eat in the morning. The results are in accord with recent studies indicating increased consumption of sugar and sweetened beverages in Malawi and South Africa in general (Kalimbira & Gondwe, 2015; Myers et al., 2017) and rural participants specifically in South Africa (Vorster et al., 2014). Existing research on adult sugar consumption in Malawi and Africa is rare, with only a few studies focusing on the consumption of sugar-sweetened beverages among the school going population (Moodley et al., 2015; Nortje et al., 2017; Reddy et al., 2012; Singh et al., 2015). In the current study, the majority of co-researchers indicated a preference for soft drinks (e.g., Coca-cola or Fanta) and biscuits or Kamba puffs, which research has shown to be common high sugar content snacks in the Malawian population (Kalimbira & Gondwe, 2015). The goal of the current dietary guidelines concerning sugar consumption is to prevent dental caries rather than obesity or NCDs (Steyn & Mchiza, 2014). This partly confirms the low recognition of the significance of T2DM, obesity, and corresponding chronic diseases in developing countries (Stuckler & Nestle, 2012).

Haggblade et al. (2016) described sub-Saharan Africa as the last region to undergo nutrition transition with an increased demand for processed food, but with a high probability to bend the curve of dietary changes and prevent corresponding illnesses if prompt action is taken, and prompt action is required. The current study revealed an increased intake of nsima, a carbohydrate-containing food. This finding is concomitant with existing research which confirm that maize-based diets in Malawi are a major source of energy accounting for more than 70% of daily calorie intake as well as nutrients (Ecker & Qaim, 2011; Mphwanthe et al., 2016). The evident high intake of sugar and carbohydrate-rich foods throughout the day among the co-researchers provide early indications of dietary patterns associated with the risk for T2DM. Indeed, the emerging obesogenic products in Malawian diets, such as sugar, saturated fats, salty processed snacks, and sweetened beverages constitute a significant risk factor for T2DM. However, these results do not rule out the influence of other risk factors for type 2 diabetes, such as sedentary lifestyles. Thus, in order to make conclusions one needs to take into consideration the possible effects of other factors such as reduced physical activity. This finding is also supported by a study of Malawian women's eating behaviours, beliefs, and attitudes that contribute to being overweight and obese, which identified idleness as a driver of frequent eating and weight gain (Ndambo et al., 2022). While it is important to acknowledge the inconsistencies between literature and the study findings in terms of physical activity levels, this could be a result of variations between households and researcher bias in interpretation.

Nutrition transition, as evidenced in this research, significantly contributes to the risk of developing T2DM (Haggblade et al., 2016; Msyamboza et al., 2014; Popkin, 2015). In Malawi, diabetes is becoming a public health challenge in line with a nutritional transition (Msymboza et al., 2014). Poverty and food insecurity reduce people's access to nutritionally healthy products, as they tend to eat what they can afford (Berkowitz et al., 2013). This was evident in the current study as participants indicated they could only eat what was affordable for them. Similarly, poverty was identified as a key driver of unhealthy eating behaviours in a Malawian study (Ndambo et al., 2022). This finding is supported by Flax et al. (2021) who isolated the cost of food and subsequent affordability as key drivers of household food purchases above food quality or healthiness among Malawian women. These affordable but unhealthy food options are highly processed, calorie-dense, rich in sugar, salt, and saturated fats (Stuckler & Nestle, 2012). Such foods have been shown to escalate obesity, which is a key driver of T2DM (Vandevijvere et al., 2015).

Nutrition transition has also been linked to agricultural systems. Malawi largely depends on agriculture as the key driver of its economic development and subsistence (Kawaye & Hutchinson, 2018). Therefore, it could be implied that efforts focused on improving agricultural production will address food insecurity and, in turn, improve the health of the general population. Moreover, food insecurity was identified as an important factor in the predictors of food consumption among mother-child dyads in Malawi (Thakwalakwa et al., 2020). However, agricultural practices that do not pay attention to natural environmental landscapes are not only harmful but also shatter the hopes for environmental sustainability (Nyantakyi-Frimpong et al., 2016). The participants expressed worry over the use of chemicals in agriculture as well as in food preparation. Most participants feared that they would be at a high risk for chronic diseases, such as cancer, heart disease, and diabetes, by consuming such chemical-filled food items. Chemical fertiliser usage is one of the modern agricultural technologies focused on increasing agricultural production and reducing food insecurity (Koppmair et al., 2017). Increased diversified agricultural production with reduced chemical additives has the potential to improve food security and enhance optimal human diets which offer protection against chronic diseases, rather than processed foods which significantly heighten the risk of obesity and T2DM (Berkowitz et al., 2013).

Conclusion

The study makes two noteworthy contributions to the field of NCD research in Malawi. First, this is the first study to investigate eating patterns associated with diabetes in Malawi and

therefore, provides primary evidence with respect to nutrition transition that may be taking place in Malawi. The current findings add to a growing body of literature on nutrition transition occurring in sub-Saharan Africa and provides a base for future studies.

Second, to investigate eating patterns associated with diabetes this study made use of photovoice methodology. Since photovoice utilises active and tangible data collection methods (Deacon, 2000), it manifested in this study that it is a better fit for dynamic, living systems, such as Malawi families. Specifically, the practical nature of photovoice enabled participants to be co-researchers in their own daily lives (i.e., exploring eating patterns), thereby, democratising the research process which is often viewed as a top-bottom, expert driven process.

There are, however, limitations to the study. The small number of co-researchers means that generalising of findings across the Malawian population is not possible. Additionally, it is important to note that Malawi is a largely rural country with over 85% of the total population living in rural and semirural settings (World Bank, 2019). Therefore, the study represents primary efforts to research on nutrition transition taking place in Malawi. Given these limitations, nationwide epidemiological research on eating patterns among Malawians and the resultant health outcomes is required. Such a study would also clearly delineate differences between eating patterns in urban and rural settings. Further research on the factors influencing dietary changes in the Malawian general population is also recommended. Larger scale participatory projects would uncover complex factors contributing to dietary shifts as well as allow empowerment of people. Such studies could also explore the potential benefits of nutrition transition as elucidated in some of this study's findings. This information will help policymakers to identify unique strategies to address the issue of unhealthy eating.

Eating patterns in Malawi are changing. While traditional staples still form the basis of a meal (e.g., nsima) there are indications of consumption of obesogenic products, such as refined, unhealthy sugars, salty processed snacks, saturated fats and sugar-sweetened beverages, all of which contribute significantly to the risk of T2DM. Considering the role these obesogenic products play in the epidemiology of type 2 diabetes, it can be concluded that the current eating patterns in Malawi are consistent with nutrition transition contributing to the risk of T2DM in sub-Saharan Africa and should be monitored to prevent a potential public health breakdown.

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