

**SPECIAL ISSUE ARTICLE**

# Green and grey: Nutritional lifestyle and healthful ageing in rural and urban areas of three sub-Saharan African countries

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**Abstract**

Increased lifespan has resulted in a growing ageing population with non-communicable diseases (NCDs) like cardiovascular disease, diabetes, cancer, among others that are chronic in nature. Thus, causing dependency, disability, poor quality of life, and increased medical costs. This paper uses South Africa, Ghana, and Uganda to understand how improved medical interventions and social-economic conditions have increased life expectancy while changing dietary and disease patterns. The countries are chosen due to their variations in urbanization and ageing levels. South Africa is more urbanized (66%) with an 8% aged population, followed by Ghana (56.06%) with a 5.3% aged population and Uganda (23.77%) with a 4.5% aged population. Lately, healthy dietary patterns are encouraged to promote healthy ageing and prevent, slow and reverse NCDs, through consumption of organic foods (higher in wholegrain foods, vegetables, fruits, with low meat consumption). Organic products are considered healthier, nutritious, fresher, and environmentally friendly because their production excludes pesticides, chemical fertilizers, and chemical food additives. Through literature reviews, we identified how older persons' nutritional patterns in South Africa, Ghana, and Uganda have evolved and their impacts on ageing. Findings indicated rising incomes and urbanization leading to nutrition transition, with traditional foods being substituted with foods high in meat, fats, refined sugars, and oils. Consequently, a double burden of diseases that are communicable and non-communicable is emerging. Changes in diets of older persons have promoted overweight/obesity and under nutrition/underweight. It is, therefore, necessary to use strategies that improve levels of organic food intake through educational programs to the aged and their families on how to control diets and lifestyles. Also, household organic food production can be promoted by encouraging growing vegetables and fruits. This will help boost older persons' nutritional wellbeing, as well as promote the production of local organic foods that are environmental friendly and socially sustainable.

**KEYWORDS**

ageing, non-communicable diseases, nutritional lifestyle

**1 | INTRODUCTION**

Increased lifespan has resulted in a growing aging population both at the global level and in Sub-Saharan Africa. In 2017, Sub-Saharan

Africa had 46 million older persons (World Health Organisation [WHO], 2017); which figure is projected to more than triple in 2050 to 165 million. Countries of South Africa, Ghana, and Uganda have also witnessed a rapid increase in the ageing population, though at

different levels. That is, 8% in South Africa, 5.3% in Ghana, and 4.5% in Uganda (Uganda Bureau of Statistics (UBOS), 2018; Statistics South Africa, 2017; United Nations (UN), 2017).

Unfortunately, Charlton and Rose (2001) indicate that, majority of the older persons in Africa are particularly more at nutritional risk because they become aged afterwards having lived poor and deprived lives. This is coupled with insufficient health care accessibility and poor quantity and quality food consumption. As a result, double burdens of communicable plus non-communicable diseases (NCDs) are faced. Regardless of where they live, most of the older persons are dying from NCDs like diabetes, cardiovascular, and cancer diseases instead of communicable diseases. Furthermore, they suffer frequently from numerous health complications simultaneously. High disability levels among older persons are additionally faced, which reflects poor quality in diet and accumulated health-related issues during the course of life (Lim et al., 2012; WHO, 2014a, 2014b).

Malnutrition, which includes both under and over nutrition, intensifies the health risks among the ageing population. Spending additional years having ill health plus disability is burdensome, as it affects individuals' quality of life, puts pressure on public health and care services, and costs to their families and the society both socially and economically (Mak & Caldeira, 2014). The increasing number of older persons makes the promotion of health and well-being a main concern for ageing well. Ageing well is conceptualized with diverse modern theoretical frameworks such as ageing successfully, healthy ageing, ageing positively, ageing productively, and ageing actively (Buys & Miller, 2012; WHO, 2014a, 2014b; Foster & Walker, 2015).

In the past two centuries, better diet is the main reason why human life expectancy has increased. Conversely, poor diet has increased risks of death and disability in the contemporary era. To age successfully involves avoiding/late onset of diseases which relate to ageing, disability, maintenance of desired functioning both cognitively, physically and socially active throughout the lifespan (Aiello et al., 2016). The relationship between nutrition and health is becoming an essential component of healthy living. In addition, the contribution of nutrition and how particular foods prevent and treat diseases coupled with improving body functioning is gradually becoming acknowledged (Bunker, 2001; Murray et al., 2013). Therefore, the prevention or delaying of most old age chronic diseases could be possible when healthy behaviours are engaged in. Without a doubt, being physically active plus good nutrition could be powerfully beneficial for health and wellbeing even in very old age. Also, with early detection of any health complications arising among the elderly, the possibility of managing them effectively is high (WHO, 2015). According to Leslie and Hankey (2015), it is very important to meet the older persons' nutritional needs to maintain their health, independent functioning and quality of life.

Even though healthy nutritional patterns are becoming significant in reducing non-communicable diseases globally (Lim et al., 2012), African countries still lag behind to put in place correct measures that seek to minimise the diseases resulting from nutritional changes among older people. This is because the nutritional interventions existing are focused mainly to children and women who are pregnant and

lactating (Charlton & Rose, 2001). This study, therefore, will help policy makers, various NGOs and partners, families and individuals in the three Sub-Saharan African Countries of South Africa, Ghana and Uganda to identify appropriate strategies to help the population age healthier by promoting the consumption of healthy diets, especially organic foods to minimise diet related diseases, thus, reducing disability and chronic non-communicable diseases among older persons.

## 2 | THEORETICAL UNDERPINNINGS

The aging theory explaining this study is the nutritional intervention called calorie or dietary restriction (CR/DR) theory (Tittikpina et al., 2019). Calorie restriction (CR) is when food intake is reduced without malnutrition. It involves reducing calorie intake while maintaining essentially required nutrients. These nutrient intakes tend to extend lifespan of various organisms, like worms, yeast, rodents, flies, fish, and rhesus monkeys, as it delays age-related functional decline. In addition, age-related chronic diseases in humans are prevented through decreasing the risk factors for diabetes, heart disease, cancer, obesity, plus hypertension (Fontana, Partridge, & Longo, 2010; López-Lluch & Navas, 2016). This is because it involves production of a response that modifies main processes in cell protection, reparation mechanisms and modulation of metabolism that allows surviving greatly against adversity (Heilbronn & Ravussin, 2003).

CR decreases metabolic rate as well as oxidative stress, improves insulin sensitivity, and alters neuroendocrine and sympathetic nervous system function in animals. McCay, Crowell, and Maynard during the 1930s were the first to provide proof that calorie restriction (CR) delays aging in addition to extending average and maximal life span (McCay, Crowell, & Maynard, 1935). Consequently, other researchers such as Barrows and Kokkonen (1982) and Weindruch and Walford (1988) have found related observations in numerous species like flies, rats, worms, mice, fish, and yeast. The energy restriction effect in humans was first experimented in lean men in the 1950s by Keys and colleagues (Keys, Brožek, Henschel, Mickelsen, & Taylor, 1950) as cited in Heilbronn and Ravussin (2003).

In overall, dietary intervention of CR is 20–40% in reducing total caloric intake. A wider range of dietary interventions as well as those having specific restrictions on macronutrients and dietary patterns are presented (Lee & Longo, 2016). The impact of CR on ageing and retarding chronic illnesses related to ageing results from reducing free radical or reactive oxygen species (ROS) generation and oxidative destruction (Lee & Longo, 2016; Sanchez-Roman & Barja, 2013).

Automatically, they reduce metabolic rate and oxidative stress; components associated with nutrition state, which impacts positively the body composition, ROS damages, insulin sensitivity, and neuroendocrine function (Lee & Longo, 2016). Experiments done on mammalian cells or models indicated that both of them could lessen the occurrence, commencement time, and advancement of many age related pathologies such as cardiomyopathy, nephropathy, type II diabetes, muscle atrophy, hypertension, autoimmune diseases, and neurodegenerative disorders including Alzheimer and Parkinson disease

(Kagawa, 1978; Keys et al., 1950). A related observation is established in humans (Mizushima & Yamori, 1992). At the present time, there is recognition that foods like lipids and lipoproteins (low-density lipoprotein LDL and high-density lipoprotein HDL cholesterol and triacylglycerol) have high risks of carrying cardiovascular (Vallejo, 1957).

Some theories of aging indicate that the aging process is influenced by food intake, thus making adjustments in diet necessary for healthier ageing minus any diseases related to ageing. Nutrients in addition to their metabolites attained from food consumption control main biological processes such as enzymatic activities, balancing energy, and stabilising genome during the life cycle. Since it's in the aging period when every process declines, a solid relationship between nutrition and age-related illnesses is made. The consumption of macronutrients such as proteins or micronutrients like magnesium, vitamins, and selenium are recommended in ensuring healthy ageing and extending lifespan. This is because they influence aging factors such as redox control, endocrine pathway, and balancing energy (Tittikpina et al., 2019).

### 3 | METHODOLOGY

We reviewed empirical studies on organic foods, and those that sought to identify nutritional patterns of older persons in South Africa, Ghana, and Uganda plus their impacts on ageing. These studies were found by searching in different journals and **research databases such as** Scopus, PubMed, Medline, Public Library of Science, BioMed Central, **Google scholar**, and so forth. **Also, key websites** (The World Health Organization, Food and Agriculture Organization etc.) were used. Systematic literature review approach to this study was deemed right as it helps to synthesise as well as critically analyse the literature in existence. This offers research results that are transparent and can be reproduced. Also it will enhance the researchers in identifying the gaps and make recommendations for future research on the topic being studied (Kushwah, Dhir, Sagar, & Gupta, 2019). In addition, this approach has got a limiting criterion which restricts the scope of review such as to particular journals sets, time frame, among others. Therefore, the current study concentrated on the literature from 2001 to 2020 to clearly help identify how nutritional patterns of older persons in rural and urban areas in Sub-Saharan Africa have evolved over time and their impacts on healthful ageing. Overall, a systematic literature review of various articles served as the primary sources of data. These articles have been cited accordingly.

### 4 | RESULTS

#### 4.1 | The impacts of ageing on nutritional lifestyle

Even though certain physiological changes the older persons face happen mainly because of the biological processes related to ageing, lifestyle factors of nutrition and being physically active modulate risk

**TABLE 1** Summary of findings on the impacts of ageing on nutritional lifestyle

Theme	Findings
The impacts of ageing on nutritional lifestyle	Financial constraints
	Low possibility of eating both organic and local food
	Increased risk of becoming malnourished
	Appetite decline due to decline in taste buds
	Impairment in digestive function leading to reduced nutrient bioavailability
	Increased ageing diseases which makes food preparation difficult
	Physiological changes (e.g., decrease in saliva secretion, reduced stomach and pancreatic juices, insulin, etc.) which affects eating and food digestion
	Difficulty in swallowing certain foods
	Reduced teeth influences eating unhealthy diets low in vegetables and fruits

factors associated with chronic illnesses (Stanner & Denny, 2009). The summary of findings on the impacts of ageing on nutritional lifestyle is provided in Table 1.

Ageing comes along with numerous changes which all may influence nutritional status. While people age, they generally experience deterioration of health. Individuals aged over 64 years further have a lesser possibility of eating both organic and local food compared to younger population (Annunziata, Agovino, & Mariani, 2019). Hence, chronic illnesses for instance heart disease, diabetes, osteoporosis, and dementia, along with disabilities, increase sharply with years (Stanner & Denny, 2009). Older persons further are at higher risk of getting malnourished as a result of diseases that are severe or chronic; having one or more chronic diseases, loneliness, among other risk factors (de van der Schueren, Wijnhoven, Kruijzena, & Visser, 2016).

Risk of under nutrition among older persons is as well increased due to some factors that have the potential of being modified. These include financial limitations, reduction in appetite, reduced dentition, and limited functioning and cognition (Bailey, Gueldner, Ledikwe, & Smiciklas-Wright, 2005). For example in Ghana, the most influential factors which affected the participants' choices of food and eating included appetite (43.9%), food availability (33.3%), and the bitterness in the mouth among others (Agbozo, Amardi-Mfoafo, Dwase, & Ellahi, 2018).

According to Mathers, Stanner, Thompson, and Buttriss (2009), ageing results into: cognitive diminishing; dementia; arthritis; decline in activity levels; declined lean body mass (muscle) and reduced bone density (for women in particular) which increases fracture risks. Also, experienced is impaired digestive functioning (such as digestive enzymes and gastric acid), thus leading to a reduction in nutrient bioavailability; changing in skin due to production of less vitamin D. Also, vision and arthritis can cause difficulties in preparing food. Changing

taste perceptions is experienced. By age 74–85, 65% of taste buds falls and decreased salt sensitivity as well as bitter tastes. The declining perceptions of taste, thirst, plus smell can directly impact eating behaviour as it reduces the desire to eat. Consequently, declined taste buds/taste dysfunction is linked with illnesses of psychiatric disorders, Alzheimer disease, diabetes (Hummel, Landis, & Huttenbrink, 2011).

Changing physiologically affects food intake and digestion due to decreased secretion of saliva, insulin, stomach and pancreatic juices, and bile. This causes a slowdown in peristaltic movements coupled with causing constipation. Older persons furthermore experience difficulties in food swallowing, with 7–10% of elderly aged above 50 years being affected. In addition, degenerative changes of mucous membrane, secretory glands, and muscle tissue of the digestive tract are faced (Granic et al., 2018; Remond et al., 2015; Sura, Madhavan, Carnaby, & Crary, 2012). In Ghana, Agbozo et al. (2018) found nutritional patterns being both fair (40%) and poor (53%) due to experiences of chewing difficulties (11%); appetite loss (12%); constipation (18%); and bloating (25%), which impacted food consumption.

Older persons having few teeth tend to consume “unhealthy” foods which are limited in fruit and vegetables, small in vital nutrients like vitamin C, and have high fat component (Stanner & Denny, 2009). WHO (2014a, 2014b) notes that in Ghana, almost two thirds of both men and women had insufficient fruit and vegetable consumption regardless of their sexes. Similarly in Uganda, findings regarding food consumption indicated fewer older men than women consumed vegetables (Tembo & Kikafunda, 2004). In South Africa, Mkhize, Napier, and Oldewage-Theron (2013) noted very low rates of vegetable and fruit consumption coupled with their consumption being in smaller portions thus not meeting the daily recommended intake. Moreover, low vegetable and fruits intake was found more prevalent amongst black elderly in South Africa (Charlton & Rose, 2001).

## 4.2 | Dietary/nutrition transition

Nutrition is associated with both human and environmental health. People's nutritional choices depend on numerous factors including culture, availability, dietary awareness, cost, taste, early food experiences, convenience in addition to changes in a person's life conditions (Delaney & McCarthy, 2011). It has been identified that wealth and poverty influence food consumption, nutritional, as well as health wellbeing. Presently, changes in economic structure are taking place, and this greatly influences people's dietary habits. As income levels increase and urbanisation takes place, different nutrition transition stages are experienced within societies. This involves changes from the consumption of food that are traditional in nature to diets that have high fat content, meat, processed food stuff, oils, refined sugar plus low fiber. This is coupled with lower physical activity levels (Popkin, 2001; Tilman & Clark, 2014; Weeks, 2012). For example in Uganda, the main diet includes: maize, sorghum, millet; plantain, cassava, and sweet potatoes. In addition, vegetables pulses, and nuts are used as diet supplements. However, recently, changes in the food consumption patterns are observed where rice is gaining reputation

among Ugandans. The nutrition transition undergoing in Uganda is mostly taking place in the urban parts, whose more than one third of its women are overweight/obese. Generally, the nutrition is still poor in foods rich in micronutrients (Kikafunda, Bader, Palma, Razès, & Dop, 2010). Even in South Africa, changing patterns in the nutritional status is observed. There is a decrease in the staple food consumption, maize porridge diets, and an increase consumption of food products from animals, plus fats and oils (Vorster, Venter, Wissing, & Margetts, 2005).

Development from preindustrial agrarian economy to an industrialized/modern society, with concurrent decline in physical activities coupled with a smaller amount of favourable foods, have a negative effect on people's health. This is by increasing degenerative diseases (Popkin, 2001; Tilman & Clark, 2014; Weeks, 2012).

Following the nutrition transition, a linked epidemiologic transition occurs. This involves disease patterns shifting from communicable and nutrient deficiency diseases to higher rates of chronic non-communicable illnesses like cancer, stroke, cardiovascular disease, etcetera (Weeks, 2012). Oniang'o, Mutuku, and Malaba (2003); Tilman and Clark (2014) and Imamura et al. (2015) add that, these modern eating lifestyles in Africa are contributing to numerous dietary disorders that threaten lives and lower life expectancies. These include diabetes, obesity, and hypertension, among others. This is evidenced in a study by Wandera, Kwagala, and Ntozi (2015) in their Ugandan study where 23% of the elderly participants noted at minimum one non-communicable disease such as diabetes (3%), heart disease (9%) and hypertension (16%) more especially amongst those aged 60–69 and 70–79. In South Africa, Mkhize et al.'s (2013) study showed most of the older persons being in many stages of hypertension. Sixteen (6%) of them were in the pre-hypertension stage; 76 (28%) were at the first stage whereas 167 (62%) were at the second stage of hypertension. On the other hand, just 11 (4%) had normal blood pressure. Again, Statistics South Africa (2017) indicated the elderly experiencing high blood pressure (50%- female, 37.9%- male); diabetes (16.6%- female, 4.4%- male); and Arthritis (18%- female, 7.1%- male). In Ghana, chronic non-communicable diseases among older adults according to Ayernor (2012) include arthritis, stroke, oral health complications, hypertension, diabetes, and cardiovascular condition (Angina). On the other hand however, the proportion of experiencing a chronic non-communicable illness in Ghana for people living in the rural was twice as likely for people residing in the urban (Ayernor, 2012).

Even though some organisms' longevity is influenced by genes, the role which the environment and behaviours play towards longevity cannot be undermined. Evidence shows that there is a possibility of preventing, slowing and reversing the beginning of several chronic diseases. This is through transforming lifestyle behaviours including nutrition and physical activity. It is, therefore, vital to recognize the nutritional patterns as well particular nutritional components which protect against chronic illnesses. Diet and healthful ageing presents its self in a two sided form: firstly, there is a necessity for improving older persons' diet, and secondly, since majority of the chronic illnesses start at an early life, there is a need for encouraging other age group categories to adjust in their diets in that they can go into old age with

**TABLE 2** Summary of findings on dietary/nutrition transition

Theme	Findings
Dietary/nutrition transition	Shift from traditional diets to diets high in fats, processed foods, meats, oils, refined sugars, low fiber diet, and lower physical activity levels.
	Wealth and poverty influence nutrition, and health
	Increased income levels and urbanization influence societies to enter different stages of nutrition transition
	Nutrition transition is associated with epidemiological transition (patterns of disease shifting away from infectious and nutritious deficiency to non-infectious diseases (e.g., cancer, hypertension, diabetes, coronary heart diseases, stroke, etc.))

a better health (Bjørnarå, Torstveit, & Bere, 2019; McKeivith, 2005). That is why globally, the contemporary matters linked to public health and environmental sustainability encourages promoting nutritional lifestyles that result into limited environmental damaging, and enhance healthy dietary habits (Bjørnarå et al., 2019). The summary of findings on dietary/nutritional transition is provided in Table 2.

#### 4.3 | Dietary patterns in rural and urban areas

Urban populations consume foods noticeably not the same as of those in the rural areas (Popkin, 2001). People in the urban areas are regarded being first to start integrating into their diet much fats, foods from animal products, and processed foods. Change in nutrition is not strictly restricted to urban places, nor to wealthier individuals of the population (Food and Agricultural Organization of the United Nations [FAO], 2006). According to Cockx, Colen, and De Weerd (2017), urbanization is progressively indicated as key contributing factor to nutritional patterns, and an influencing force behind “dietary changes.” This has accelerated intense changes in c foods consumed, physical activity and the occurrence of numerous nutrition related non-communicable illnesses.

Possible causes in the differences between foods consumed in the rural and urban are increasingly being explained. These vary from increased income and changes in the prices to differences in lifestyles and being much exposed to global eating patterns (Cockx et al., 2017). For example, a study by Charlton and Rose (2004) in South Africa indicated that for all the ethnic groups, food poverty rates in older person headed households influenced nutrition and this was higher in rural compared to urban households. Moreover among black households, of five people (the average household size), high food poverty rates was high in rural areas with 71.2% compared to their urban counterparts with 61.1%.

With sub-Saharan Africa's quick urbanization, a number of people will be born in towns, thus high possibility of acquiring as children, dietary habits contributing to chronic illnesses (Sodjinou, Agueh, Fayomi, & Delisle, 2009). For example in Ghana, findings by the

WHO (2011) indicated that cancer, cardiovascular, and respiratory diseases being the three common greatest reasons for dying among all ages. Cockx et al. (2017) note that people relocating to urban areas experienced a greater change away from consuming traditional foods, to consuming high-sugar foods, and those that are convenient in consumption and preparation. In a Ugandan study by Tembo and Kikafunda (2004) it was found that red meat consumption was more prevalent in urban compared to rural areas.

Findings by Charlton and Rose (2001) in their African study about nutrition noted that in some urban areas, older adults experienced the nutrition transition. Thus, one of the challenges particularly faced was anaemia related to suboptimal folate status. Also, huge nutrition problems which led to nutrition transition resulted from dietary inadequacies and increasing problems of overnutrition. Popkin, Adair, and Ng (2012) and Cockx et al. (2017) acknowledged that developing countries are progressively experiencing a “double burden of malnutrition,” where under and over nutrition occur simultaneously. Moreover, the prevalence of overweight was increasing greatly in urban parts. For instance, South Africa's frequency of obesity was high amongst urban dwellers with 47% (Phaswana-Mafuya et al., 2011).

In addition, small living spaces and absence of facilities to store and cook lead to greater dependence on consuming foods that are convenient. Generally, it is presumed that the cost of traditional food stuffs in urban places will be different and new items are added to the mixture which later can influence the nutritional patterns (Regmi & Dyck, 2001). In addition, in rural areas, reduction in the farming practices of local foods hinders producing and consuming organic food. This is due to limited land, climatic changes which may affect farming, among others. For example a 2012 study in Northern Ghana by World Food Programme (WFP) and Ghana Statistical Service (GSS) found that nearly all participants were smallholder farmers with most cultivating areas of less than five acres. In addition, even though majority of the rural families were agriculturalists or agropastoralists, a great deal of food was bought, while merely little proportion was got from their own production. This exposed them to increased prices of food (WFP & GSS, 2012).

On the contrary however, other findings indicate reduced consumption of fruits and vegetables in rural areas. For example in Ghana, consumption of fruits and vegetables was marginally lesser among rural elderly persons with 70% compared to their urban counterparts with 67%. Also, the consumption of fruits and vegetables was worse among the elderly with lowest income by 75% (WHO, 2014a, 2014b). Also in South Africa, the elderly residing in rural areas, those whose education levels is less than primary plus those having lower wealth quintiles could not eat fruits and vegetables adequately (Phaswana-Mafuya et al., 2011). The summary of findings on dietary patterns in rural and urban areas is provided in Table 3.

#### 4.4 | Gender and nutrition

Similar to other developing countries, aged women will be more than men due to their higher life expectancy (Aboderin, 2005; Ferreira &

**TABLE 3** Summary of findings on dietary patterns in rural and urban areas

Theme	Findings
Dietary patterns in rural and urban areas	<p>Difference in the dietary patterns of rural and urban populations</p> <p>Urbanization is one of the driving forces behind nutritional changes (due to increase in incomes, changes in relative prices of traditional foods and life style)</p> <p>Increased obesity and anaemia in urban areas compared to rural areas</p> <p>Food poverty rates higher in rural areas compared to urban areas</p> <p>High consumption of red meat in urban areas compared to rural areas</p> <p>Limited living spaces, lack of storage and cooking facilities in urban areas influence the consumption of convenient foods.</p> <p>Climate change and limited land is affecting farming in rural areas hence change in diets</p> <p>Reduced fruit and vegetable intake in both rural and urban areas</p>

Kowal, 2006; Smith & Mensah, 2003; UN, 2002; Wilson & Adamchak, 2001). According to Hindin (2000), gender differences in the African context are a social determinant of illness in households where men completely control income, resulting into lower nutritional status among women.

Disaggregated data reveal a noteworthy nutritional variance amongst men and women (Maila, Audain, & Marinda, 2019). Overweight and obesity levels are higher in some African countries, particularly amongst women, causing a double burden of illnesses. On the other hand, alcohol and tobacco intake is predominantly higher among men, which harmfully affect the nutrition wellbeing (Kimokoti & Hamer, 2008). A South African study by Mkhize et al. (2013) found overweight, obesity especially being rampant, among women than men. Similar findings were noted in Ghana's elderly women (aged 60–92 years), in rural areas where 40.7% were underweight and 15.3% were overweight (Blankson & Hall, 2012).

Concerning the socio-demographic variables, findings amongst men indicate their decreased likelihood to consume sustainable foods which are organic (6.2%) and local (3.8%) (Annunziata et al., 2019). Imamura et al. (2015) found that averagely, women's nutritional patterns were better than the men's. Women have a tendency of endorsing healthy eating habits than men (e.g., taking dietary recommendations very serious and important) (Fagerli & Wandel, 1999); making food choices greatly centred on healthy food content (Ree, Riediger, & Moghadasian, 2008). Consumers undeniably relate healthy foods like yogurt, vegetables with femininity and connect unhealthy foods like red meat with masculinity (Jensen & Holm, 1999; Sobal, 2005). Therefore, there is an anticipation of a positive association between femininity and

**TABLE 4** Summary of findings on gender and nutrition

Theme	Findings
Gender and nutrition	<p>Households where men completely control income influence lower nutritional status among women</p> <p>High alcohol and tobacco consumption among men</p> <p>Underweight of older women especially in rural areas</p> <p>Reduced probability of consuming sustainable food (both organic and local) among men</p> <p>Women on average have better dietary patterns than men</p> <p>Women endorse healthy eating practices more than men</p> <p>Women make food choices more based on healthy food content and recommendations than men</p>

allegedly consuming healthy organic foods (Shina & Mattilab, 2019). The summary of findings on gender and nutrition is provided in Table 4.

#### 4.5 | Poor nutrition as an impediment to healthful ageing

Globally, there is an increase in life expectancy, which is likely to impact numerous societal aspects differently, specifically if these later years are comprised of ailing health. Fundamentally, ageing is naturally a part of life. However, how we age, our health and functional ability are not only determined by our genetic composition, but also on our lifetime lifestyle choices made. Evidence associating diet and lifestyle factors during one's course of life with healthful ageing is coming up. Thus, it will never be too late to acquire healthy practices (Stanner & Denny, 2009).

Diet relates with the ageing process in numerous ways, and the diet related health challenges increase as life advances. Dietary consumption and nutritional status throughout life can influence health and well-being in old age. Scientific researches continually suggest that nutrition plays a central role in the beginning of chronic diseases. Hence increased illnesses, reduction in the quality of life, and dying prematurely are faced. Particularly, foods higher in calories, fat, cholesterol, and salt, and low in fiber-containing foods (e.g., fruit, vegetables, and whole grain products) are linked with increased risk for diabetes, hypertension, coronary heart disease, cancer, and stroke, in adulthood (Leslie & Hankey, 2015; Phillips, 2003). Nawagi et al.'s (2018) study in Uganda revealed participants highly experiencing bone and joint pain which are frequently untreated. This was associated to eating low-calcium diets with many being ignorant about the foods rich in bone building nutrients such as calcium and vitamin D. The second greatest reported medical condition relating to age was hypertension which was linked to poor nutrition and lifestyle issues.

Again, Tembo and Kikafunda (2004) in their Ugandan study found severe occurrences of malnutrition amongst older persons. The risk factors which contributed to the dietary risk included deprived health

**TABLE 5** Summary of findings on poor nutrition as an impediment to healthful ageing

Theme	Findings
Poor nutrition as an impediment to healthful ageing	Lifestyle choices made over time affects how people grow
	The rate of nutrition risk health related problems increase in old age
	Diets high in calories, fat, salt and low in fiber increases the onset of chronic diseases, reduced quality of life, and premature death.
	Eating low calcium diets increases the risks of experiencing arthritis/joint pains
	Inadequate food intake/skipping of meals results into malnutrition of older people

status, insufficient food consumption, diminished mobility, and destructive lifestyle habits. Also, malnutrition among the Ugandan elderly according to a study by Alphas, Atuhairwe, Amongin, and Taremwa (2018) resulted from skipping of meals 191(91.2%) and having insufficient foods/ shortage of food supply (84.0%). On the other hand, sometimes the elderly ate lesser amount food with a motive of ensuring that other household members got something to eat. Similar findings of food insecurity were found in Ghana by Tayie, Adjetey-Sorsey, Armah, and Busolo (2004) where 24% of older persons stated missing/skipping meals, especially lunch. This resulted into underweight by 62.2% in men and 44.6% in women. In South Africa, Charlton and Rose (2004) found a higher amount of older South Africans, mostly black older persons, lacked accessibility to a basic subsistence diet, hence being replaced with greater risks of malnutrition. The summary of findings on poor nutrition as an impediment to healthful ageing is provided in Table 5.

#### 4.6 | Benefits of healthy diet and why consumption of organic should be encouraged

The possibility of many people ageing healthfully is high given that nutrition plus additional lifestyle factors play a moderating role (Kiefte-De Jong, Mathers, & Franco, 2014). Over the years, there is increasing proof that nutrition plays a role in preventing and treating numerous chronic illnesses. Healthful eating habits are positively related with good nutritional status as well as quality of life. Also, there are reduced rates of non-communicable diseases such as heart diseases, obesity, cognitive decline, cancer, type 2 diabetes among others (Jędrusek-Golińska et al., 2020; Stanner & Denny, 2009).

Diet and lifestyle can influence healthy lifespan. Healthful eating and being physically active regularly enhances recovery from diseases coupled with protecting against health complications. In addition, the risk incidences of losing weight, under nutrition, nutrient deficiency and illnesses such as anaemia are all minimised. Furthermore, healthy

diets are vital in preserving the immunity system, digestion (constipation), bone, visual, and oral health. Also, cognitive capacity, and mental functioning are improved (Mathers et al., 2009). Therefore, the dietary quality turn out to be gradually significant when ageing since it comes along with declined functioning physiologically, changing body composition and decreasing energy requirements (Brownie, 2006; Jensen, McGee, & Binkley, 2001).

Diet and health are clearly linked naturally. Increasing lifespan has given rise to an increased search for diets that encourage healthful ageing. On the contrary, diets having the possibility of increasing the risks experiences of chronic illnesses like cardiovascular diseases, diabetes to mention but a few are being heavily criticised. Viewing diet and health in the lenses of ageing call for selecting some concepts and traditions that are especially enlightening to help in predicting future developments (Heinrich & Prieto, 2008).

Eating healthy foods for a long period is linked with improving cognitive functioning. For example it slows and prevents cognitive decline, dementia, and Alzheimer's illness. The nutritional patterns include numerous common components including consuming foods high in fruits, vegetables, whole grains and reduced intake of sweet and red meats (Abbatecola, Russo, & Barbieri, 2018; Marchand & Jensen, 2018; Russell et al., 2013).

Consequently, organic agriculture is quickly growing as an important sector under the food industry due to the healthful benefits associated with consuming organic foods (Mesnage, Tsakiris, Antoniou, & Tsatsakis, 2020). Generally, organic food is a plant or animal based produce which evades or reduces the utilization of chemical fertilizers; growth regulators and additives; pesticides; herbicides; and other synthetic chemical substances when producing, processing and storing them. Health concern of organic foods and their perception as being environmentally responsive, healthy and having a better taste than conventional foods is also recognised (Gottschalk & Leistner, 2013; Singh & Verma, 2017; Yadav et al., 2013; Yousuf, Titikshya, & Singh, 2018).

Another emerging important element is sustainable consumption. For example under goal 12 of the agenda, 2030, food consumption is acknowledged being a key sustainability issue as it affects people's public health, natural resources, as well as the economic wellbeing (De Boer, Hoogland, & Boersema, 2007; Thøgersen, 2017). According to the Food and Agriculture Organization (FAO), sustainable diets have low effects on the environment. This contributes to food security and healthful living for contemporary and future generations. They protect and respect biodiversity and ecosystems, are accepted culturally, easy to access, economically fair and can be afforded. Also, they are adequately nutritious, safe, healthy, and optimizes natural as well as human resources (FAO, 2012).

Organic foods can provide an alternate method to sustainability because of their green nature, which is a growing importance worldwide. Organic food is a better sustainable alternative as it is regarded as more healthy, fresh, environmental friendly, and support the local economy compared to conventional foods (de Magistris & Gracia, 2016; Mesnage et al., 2020; Strassner et al., 2015; Verain, Dagevos, & Antonides, 2015). Countless organic agricultural studies

propose that practicing organic system is less destructive to the environment, can encourage social well-being as well as contribute to economic resilience (Schader, Stolze, & Gattinger, 2012; Schader, Stolze, & Niggli, 2015). Consuming organic foods has a conventional safety because of producing them by ecologically and environmentally sound methods which exclude synthetic inputs like fertilizers and pesticides; lack genetically modified organisms (GMOs). Their processing excludes irradiation, industrial solvents, or chemical food additives. All artificial pesticides and fertilizers are avoided while solely natural additives when processing food are allowed. Rural places may have a reduced spending on organic food due to the portion of home grown vegetables (Hasselbach & Roosen, 2013; Huber, Bakker, Dijk, Prins, & Wiegant, 2012; Janssen, 2018; Kriwy & Mecking, 2012; Massey,

O' Cass, & Otahal, 2018; Paul & Rana, 2012; Rana & Paul, 2017; Smed, Andersen, Kærgård, & Daugbjerg, 2013; Tobin, Larkin, & Moane, 2011).

Studies on epidemiology have connected organic foods with reduced occurrences of obesity, especially when plant-based organic foods are consumed (Kesse-Guyot et al., 2017). They also reduce cancer incidences especially postmenopausal breast cancer, non-Hodgkin lymphoma, and all lymphomas (Baudry et al., 2018).

Organic food consumption includes typically healthy nutritional patterns, high in fruits, vegetables, wholegrain, and low in meats (Baudry et al., 2015). Oniang'o et al. (2003) in their study indicate the significance of grains in diets including provision of minerals, carbohydrates/ starches, vitamins, fibre, and phytochemical compounds. Grains may be divided into two categories: whole grains, which are comprised in African diet and nonwhole grains which are mostly consumed by urban populations.

A diet rich in fibre is necessary due to the impact it has regarding to illnesses associated with diet. Diets with insoluble fibres are recognized in relieving constipation in addition to reducing colon cancer occurrences. The importance of fruits and vegetables in providing minerals, fibre, vitamins, and phytochemical substances is acknowledged. Vitamin C prevents gum bleeding, helps to heal wounds, fractures, and bruises and also prevents vision impairment (Denny, 2008; Oniang'o et al., 2003). Potassium helps in keeping all body parts to run efficiently, maintains water and electrolyte balance in addition to helping regulate the functioning of nerves and muscles. One of the regarded sources of potassium is fruits. Vitamin A (a fat-soluble vitamin) enhances vision, normal reproduction, growth, and developing of bones (Oniang'o et al., 2003).

Consuming diets rich in whole-grain regularly reduces the risks of type 2 diabetes. Generally, there is evidence of the relevance of good nutrition in healthful ageing. Many practical measures exist which could be applied to support in improving people's health and quality of life in old age (Denny, 2008). The summary of findings on the benefits of healthy diet and why consumption of organic should be encouraged is provided in Table 6.

**TABLE 6** Summary of findings on the benefits of healthy diet and why consumption of organic should be encouraged

Theme	Findings
Benefits of healthy diet and why consumption of organic should be encouraged	Clear link between diet, health, and ageing
	Healthy diet is associated with better nutritional status and quality of life
	Healthy diet decreases the incidences of chronic non-communicable diseases such as obesity, cancer, cardiovascular diseases, and so forth.
	Healthy nutrition assists in preserving immune function, digestive health (constipation), bone health, oral health, and vision
	Long period consumption of foods high in fruits, vegetables, whole grain and low in red meat and sweets slows and improves cognitive decline, dementia, and Alzheimer's disease
	Consuming whole-grain regularly is linked with decreased risks of type 2 diabetes
	Organic foods are considered healthier and effective in promoting healthful ageing because they do not use fertilizers, growth regulators during their production
	Organic foods offers opportunity to sustainable consumption diets due to their impact to individuals, public health, and natural resources
	Organic foods have low environmental impact which contribute to food and nutrition security and health for both present and future generations

## 5 | SOME PRACTICAL IMPLICATIONS

It is necessary to employ different strategies to increase everyone's consumption of foods that are healthy, traditional, economical, and easily accessed. Improvement in the intake levels of organic diets could be done through; health talks as well as educational programs to the aged and their families on how to control diets and lifestyles. According to Sodinou et al. (2009), interventions that focus in preventing diet related chronic illnesses among older persons ought to be encouraged. Healthy components in diets have to be maintained at the same time encouraging consuming more fruits and vegetables. In addition, recommendations for governments dedicated in integrating pest management include: elimination of subsidies on pesticides, discouraging the spraying of pesticides on produced staple foods, an arrangement among national and international agencies and deviating funds previously spent using chemicals to developing human resources (Yousuf et al., 2018).



Also, household local organic food production can be promoted by encouraging growing vegetables, fruits, and other foods on a small piece of land including the back yards of houses. This would help boost the nutritional wellbeing of low income older persons as well as promoting environmentally in addition to socially sustainable production of local organic foods.

A lifelong method of minimizing ageing effects is vital, as risks of chronic diseases are increased by being exposed to risk factors beginning at an early life and going forward. Multi-disciplinary approaches to healthful ageing are thus vital by encouraging healthy eating, being increasingly physically active and tackling chronic illnesses like obesity and diabetes amongst all age group brackets. Furthermore, educational programmes in schools starting at an early age can be useful in promoting healthy attitudes as well as equipping children with skills of controlling their personal diets and lifestyles are essential elements (British Nutrition Foundation, 2003).

## 6 | RIGHTS-BASED IMPERATIVES

The African Union obliges its member states to implement older people's rights as stipulated in the protocol to the African charter on human and peoples' rights on the rights of older persons in Africa. Articles (3, 8, 10, 13, 15, and 19) highlight some of the rights that can enhance the wellbeing of elderly persons through all areas of their lives, thus enhancing their nutritional wellbeing (African Union Commission, n.d). The protocol will necessitate governments and families ensure that the basic human rights of the senior citizens are respected, their dignity maintained and their needs met, including providing them nutritious and healthy foods and care for those in need of long term care. This will enhance healthful ageing. For example:

Article 3 deal with eliminating all forms of discrimination faced by the elderly and encourages the abolition of social and cultural stereotypes which marginalise them. Also mentioned is the support and enforcement of local, national, regional, continental and international customs, traditions and initiatives, which are geared towards eliminating all discriminating forms faced by older persons. All forms of discrimination mentioned here could also relate to those relating to nutrition. This is because despite of older persons having numerous nutritional needs which change with ageing and food insecurity, most often families and aid programmes give priority to the younger people during scarcity periods. Also, sub-Saharan Africa countries nutritional policies implemented give low priority to the elderly. With this article therefore; Sub-Saharan countries will draw attention towards developing programmes aimed at addressing the nutritional needs of older persons.

Article 8 aims at protecting older persons from abuse and harmful traditional practices. To achieve this, state parties are tasked to ban and make harmful traditional practices directed at older persons a crime. Also required is taking essential measures in abolishing harmful traditional practices like witchcraft accusations, which affect older persons' welfare, health, life and dignity of especially elderly women. In some African families and communities, the elderly women are

regarded as witches who bring bad luck and calamities like death, diseases, among others. As a result, they are taken to camps where they are abused by being denied food which affects their nutritional wellbeing and some even end up dying in the camps while abandoned by their families. With the implementation of this article, all these abuses and harmful traditional practices will be reduced hence the nutritional status of elderly persons particularly women being greatly improved.

Article 19 deals with creating awareness on ageing and preparing for Old Age. This is especially to the younger population groups to remove negative attitudes against older persons. This increased awareness will help families and community on the nutritional needs of older persons under their care and the rightful foods they should provide. This will not only improve the nutritional wellbeing of the elderly persons, but also the younger generations will learn to eat healthy diets which will promote their healthy ageing.

## 7 | CONCLUSION

Modern feeding patterns adopted by most Africans have influenced numerous life threatening nutritional illnesses, which have resulted into a double burden of both communicable and non-communicable diseases (NCDs) in the continent. On the other hand, dietary deficiencies have resulted due to poverty, limited resources, comprising labour, land, and time, particularly for women. Thus, reducing the consumption of locally produced organic foodstuffs. This has affected healthful ageing as most aged people battle with multiple diseases and disability in later years. It is, therefore, important to promote good dietary habits in both rural and urban populations in Sub-Saharan Africa. This can be through adequate awareness campaigns by giving information about nutrients plus their relevance, whereas specifying commended food sources.

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