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Impact of Food Systems Transformation on Dietary Patterns and Public Health in Africa: A Mini Review

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Authors' contributions

This work was carried out in collaboration among all authors. Authors CUO and COE conceptualized. Authors CUO, COE, IAO, UNO, GKA-B, SCE, RKO, JAE and BTA wrote original draft, reviewed and edited the manuscript. All authors read and approved the final manuscript.

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ABSTRACT

Background: The African food system has undergone significant transformations due to globalization, urbanization, economic development, and policy changes. However, agricultural productivity has been constrained by climate variability, limited technology, and inadequate infrastructure. This study aims to present the current state of evidence on how shifts in Africa's food system affect dietary intake and health outcomes.

Methodology: A comprehensive literature search was conducted using databases such as PubMed, Web of Science, Scopus, and Google Scholar. Keywords included "food systems transformation," "dietary patterns," "public health," "nutrition transition," and "Africa". Seven (7) studies published in English from 2010 to 2023 were selected based on their relevance. Studies included assessed the impact of food system changes on diet and health across four African regions. Data extraction was performed independently by three reviewers to ensure accuracy and a narrative synthesis approach was used to integrate findings from the selected studies.

Results: The review identified that urbanization and economic development have shifted African diets from traditional, nutrient-rich foods to processed foods high in sugars and unhealthy fats. Trade liberalization has increased access to energy-dense, nutritionally poor foods, raising obesity and non-communicable disease rates. Supermarket expansion and adoption of modern food processing techniques have driven preferences for convenience foods and animal products, causing dietary imbalances and a double burden of malnutrition. Climate change and political instability exacerbate food insecurity, particularly among women and children, further increasing vulnerability to infectious diseases and straining healthcare systems.

Conclusion: Current changes in Africa's food system have significantly impacted dietary patterns and public health, resulting in increased healthcare expenditure and a greater demand for medical services to address both ends of the malnutrition spectrum and diet-related non-communicable diseases. Addressing these challenges therefore requires investments in sustainable agricultural practices, nutrition-sensitive policies that promote equitable food production and distribution, and comprehensive food security strategies.

Keywords: Food systems transformation; dietary patterns; nutrition transition; public health; Africa.

ABBREVIATIONS

FAO : Food and Agriculture Organization
FBDGs : Food-Based Dietary Guidelines
NCDs : Non-communicable Diseases
SSB : Sugar-Sweetened Beverage
UPFs : Ultra-processed foods

1. INTRODUCTION

The African food system in the last few decades has been in the process of transition due to different factors which include globalization, urbanization, economic development and change in policies. Generally, African diets are more diverse and mainly consist of foods such as whole grains, beans, vegetables, fruits, and nuts [1]. These diets which are still rich in fibre, vitamins, and minerals have in the past contributed to lower incidences of Non-Communicable Diseases (NCDs). Nevertheless, despite agriculture being the largest employer in Africa contributing to about 23% of the gross domestic product, productivity has been hampered by climate change, weak access to technology, and unfavourable infrastructure [2].

Trade liberalisation has led to the greater accessibility of imported foods, particularly processed and packaged foods, that are laden with unhealthy fats, sugars, and salt, and this has caused a dietary transition from traditional to modern diets that are energetically dense, but nutritionally poor [3]. Emerging of new food distribution systems has also influenced food intake due to rapid urbanization where more consumers have easy access to fast foods and street foods, which are processed and of less nutritional value than traditional food [4]. Furthermore, increased purchasing power due to business development and economic growth has shifted food consumption habits towards convenience foods and animal products [5]. These changes have impacted dietary diversity and led to the double burden of malnutrition which is evident in people suffering from both undernutrition and overnutrition and obesity within the same populations as depicted by Muthuri et al. [6].

However, undernutrition persists to be a significant concern, especially for children and women of reproductive age while overnutrition

and obesity are on the rise hence the increasing incidence of diet-related NCDs including diabetes, hypertension and cardiovascular diseases [7]. NCDs add further pressure on strained health systems [8]. Food insecurity persists as a major challenge, indicating that many households lack adequate, safe, and nutritious food across the globe due to climate change, political instability, and unequal economic growth [9]. Nutrition is also linked to infectious diseases in that poor-quality diets compromise immunity and lead to higher vulnerability to infections like HIV/AIDS, malaria and tuberculosis among others [10]. Food production and availability have been affected by government policies and international aid with policies that support cash crops for export, reducing food crops for consumption [11].

Understanding how changes in the food system mediate diet and health in Africa is crucial [6]. Consumption of processed and high-calorie foods has disrupted a healthy diet and contributed to not only undernutrition and obesity but also to a rise in NCDs that burden the healthcare systems in the developing world [8]. In addition, improvements in the quality of agricultural inputs, yields, and supply and demand influence the supply and consequently affect food security and the economy [9]. Addressing these challenges requires policy action that supports sustainable production of food, adequate food supply and a healthy healthcare sector approach [11].

This narrative review seeks to provide the current standing evidence on how changes in Africa's food system influence dietary patterns and health. Based on the findings of this study, recommendations will be made to the policymakers and those in the public health sectors to help improve the nature of the food systems that are developed in Africa, particularly in the resourceful regions.

2. METHODOLOGY

2.1 Literature Search

To understand the effects of changes in the African food system on dietary practices and health, a comprehensive literature search was conducted. These included research databases such as PubMed, Web of Science, Scopus, and Google Scholar. Search keywords used included 'food system transformation,' 'dietary patterns,' 'public health,' 'nutrition transition,' and 'Africa'. The search was restricted to articles published in English from January 2010 to December 2022 to access the most recent and relevant literature.

2.2 Selection Criteria

The inclusion criteria used to select the studies were intended to give the studies relevance and credibility. Only research on African people across four African regions (West Africa, Southern Africa, East Africa and Central Africa) were selected, particularly the papers discussing shifts in food systems including agriculture, production, distribution, and consumption. The identified papers had to assess the consequences of such modifications on diet and the prevalence of obesity, malnutrition, diabetes, and cardiovascular diseases. Studies that failed to include Africa, articles that did not discuss the effects of the transition in food systems, papers published in a language other than English, and non-refereed articles were excluded.

2.3 Data Extraction and Synthesis

Data extraction was independently performed by three reviewers to ensure accuracy and minimize bias. A standardized data extraction form was used to gather information on study characteristics such as authors, year of publication, study design, detailed descriptions of the food system changes examined, measured outcomes like dietary patterns and public health implications, and the main results and conclusions drawn by the authors. Any discrepancies in data extraction were resolved through discussion and consensus. A narrative synthesis approach was adopted to integrate the findings from seven (7) selected studies. This method involved thematic analysis to identify recurring themes and patterns, and comparative analysis to highlight consistencies and discrepancies between studies. The synthesis of evidence aimed to summarize how food system changes have impacted dietary patterns and public health in Africa, highlighting key trends and identifying gaps in the literature.

3. RESULTS AND DISCUSSION

Table 1 presents characteristics of the included studies. The research design employed by the reviewed studies are cross-sectional, longitudinal, mixed-method, and qualitative methods. The review highlight significant shifts in dietary patterns across four African regions due to urbanization, economic growth, and changing

food systems. These dietary changes have notable public health implications, particularly the rise in non-communicable diseases (NCDs) such as obesity, diabetes, hypertension, and cardiovascular diseases.

3.1 Changes in Dietary Patterns and Public Health Implications

Due to urbanization and the increase in the economic status of nations across the African continent, the earlier types of diets that were energy sparse, non-processed and high in complex carbohydrates have been replaced with energy-dense processed foods and sugars such as soft drinks and fast foods (Fig. 1) in particular among the urban dwellers. These changes in diet are not peculiar to Africa; there are changes of a similar nature that have happened globally across the Asian and Latin American continents. The local diets that are composed of whole grains, fruits and green vegetables are gradually being replaced with processed foods, sweet beverages and junk foods. In Asia, there has been a trend towards higher intakes of Ultra-processed foods (UPFs) and Sugar-sweetened beverages (SSBs), which is associated with rising obesity levels and diet-related NCDs, particularly in urban settings [12]. In the same manner, Baker & Friel [13] identified that the prevalence of processed foods in Asian diets has extensive detrimental effects on public health, obesity and NCDs. In Latin America, Monteiro et al. [14] noted that advancements in the global food system are seen to be shifting to ultra-processed products leading to an increase in obesity and non-communicable diseases. Hawkes et al. [15] noted that increased urbanization has significantly influenced diet quality among Latin Americans, where the population has shifted towards the consumption of processed and fast foods, similar to other global urbanizing regions where this has given rise to public health issues. The nutrition transition is characterized by both undernutrition including stunting and micronutrient deficiencies on one hand, and overnutrition indicated by obesity, type 2 diabetes, and cardiovascular diseases on the other hand. For obesity and related NCDs, urban people are more vulnerable although rural people are still at considerable risk of undernutrition. The same trends are equally seen in South America and Southeast Asia [16] which have a nearly equal bulk of people suffering from obesity and NCDs as in Africa. The population of urban settings all over the globe is becoming more and more affected by obesity and diet-related NCDs as a result of the transition to more processed and energy-dense foods [17].

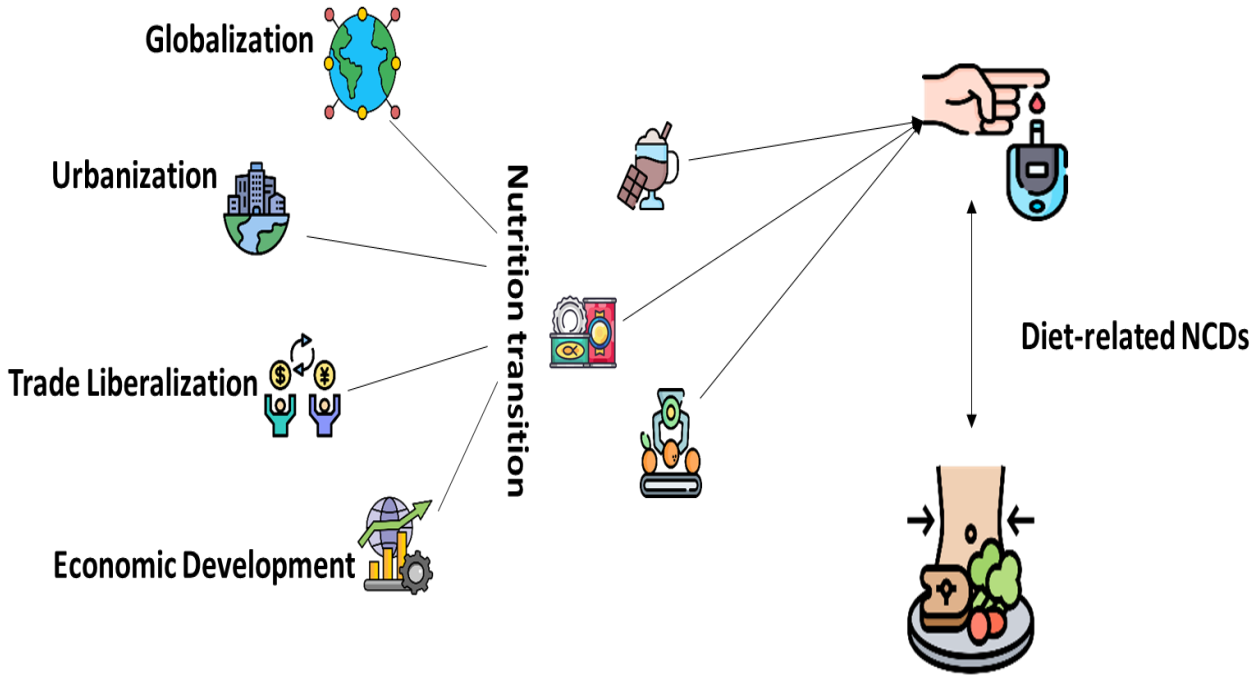

Fig. 1. Impact of Food Systems Transformation on Dietary Patterns and Public Health

Table 1. Summary of Included Studies

Author, year	Objective	Study design	Country/Region	Dietary patterns	Public Health Implication
Holmes et al. (2018) [18]; Ronquest-Ross et al. (2015) [19]	To identify predominant dietary patterns and analyze changes in food consumption patterns in South Africa since 1994 and explore their health implications.	Cross-sectional survey	South Africa (Southern Africa)	Modern dietary patterns in South Africa are characterized by high intakes of cold cuts, sweets, and refined grains.	This dietary shift has led to a significant increase in obesity and related NCDs, particularly among women and urban populations.
Vorster et al. (2011) [20]; Stupar et al. (2012) [21]	To examine the nutrition transition in Africa, focusing on changes in dietary patterns and nutrient intakes, the determinants and consequences of these changes, and possible new approaches in public health nutrition policies and interventions.	Mixed-method approach	Ghana (West Africa)	Due to Urbanization, Ghana is experiencing a nutrition transition with rising consumption of energy-dense foods and a decreasing intake of traditional staples.	The prevalence of obesity and related NCDs is rising, particularly in urban areas.
Haggblade et al. (2016) [22]; Keding et al. (2011) [23]	To explore the early stages of nutrition transition in Uganda, highlighting the emerging issues of overweight and obesity and their implications for public health.	Longitudinal design	Uganda (East Africa)	With urbanization and economic growth, there has been a shift towards more processed foods and sugary beverages. The availability and consumption of fast foods have also increased.	While undernutrition remains a concern, the rising trend of overweight and obesity poses new public health challenges.
Akarolo-Anthony et al. (2013) [24]; Sanusi et al. (2021) [25]	To describe the pattern of carbohydrate intake among Nigerian adults and explore its association with the risk of developing type 2 diabetes.	Cross-sectional survey	Nigeria (West Africa)	The diet of urban Nigerians has shifted significantly towards higher consumption of rice, bread, and processed foods, with a notable decrease in the consumption of traditional staples.	Nigeria faces the dual challenge of undernutrition and overnutrition, with both stunting in children and obesity in adults being prevalent.
Keding et al. (2016) [23]; Vorster et al. (2011) [20]	To investigate the nutrition transition in Africa, examining dietary changes, determinants, and public health implications, with a focus on creating positive	Mixed-method approach	Democratic Republic of Congo (Central Africa)	Urban Congolese diets show a higher intake of processed foods including bread, sugary snacks, beverages and fats, while rural diets remain more traditional but less	The double burden of malnutrition is evident, with urban areas experiencing higher obesity rates and rural areas struggling with stunting

Author, year	Objective	Study design	Country/Region	Dietary patterns	Public Health Implication
	public health strategies.			diverse and nutrient-rich.	and micronutrient deficiencies.
Steyn et al. (2012) [26]; Peters et al. (2018) [27]	To understand the mechanisms behind the adoption of obesogenic dietary behaviors among rural-to-urban migrant women in Nairobi, Kenya. The study examines the perceptions and experiences of these women regarding their current urban food environment and changes in dietary behaviour.	Qualitative method	Kenya (East Africa)	Studies indicate a significant shift in dietary patterns in urban areas, with higher consumption of fats, oils, and sugars compared to rural areas.	Rural-to-urban migration has been associated with significant dietary changes among women, with a shift towards energy-dense, nutrient-poor foods and increased obesity rates.
Nnyepi et al. (2015) [28]; Katsidzira et al. (2018) [29]	The study examined the nutrition transition in Southern Africa, including Zimbabwe, focusing on dietary changes, health outcomes, and policy responses.	Cross-sectional survey and policy analysis	Zimbabwe (Southern Africa)	Increasing reliance on processed and convenience foods, sugary beverages, and fast foods. This transition has been accompanied by a decline in the consumption of traditional foods which are often perceived as less desirable in urban settings.	Rising rates of obesity and related non-communicable diseases (NCDs) such as diabetes, hypertension, and cardiovascular diseases.

3.2 Policy and Intervention Responses

The increment of NCDs because of a shift from traditional dietary practices to processed foods has led to the formulation of policies by the government of South Africa. They comprise the taxation of sales of sugary products, especially the SSB tax aimed to cut the consumption of such products and at the same time generate revenues for health programs [30], as well as healthy food environment policies aimed at controlling food promotions, enhancing the standards of food labelling, and encouraging the production of healthy food products [31]. Some of these initiatives' obstacles include industry pushback, economic effects, and varying implementation needing more political dedication and funds.

Non-communicable diseases (NCDs) are the main target of public health interventions in Africa through nutrition education, school programmes, community health with a view of changing diet patterns [32]. The latter focuses on increasing the understanding of the people on the importance of proper diet, improving the quality and nutritional value of the meals offered in school, and encouraging people engaged in community health to exercise and maintain a healthy diet. Some of them include the Food-Based Dietary Guidelines (FBDGs) for balanced diets (WHO, 2021), the students and school-based nutrition education in Kenyan and Ghanaian schools [33], community early detection and management of NCD programs in South African and Nigerian communities [34].

Community-based approaches support increased consumption of culturally appropriate foods and counter the nutrition transition by reorienting people on traditional staples, setting up community gardens, and conducting cultural awareness programs. These kinds of programmes enhance the proportion of diversified kinds of foods consumed and augment the quality of nutrients consumed while at the same time maintaining culture. Some of them are in Zimbabwe; promoting millet and sorghum [35], urban farming in Nairobi and Harare providing fresh produce (Peters et al., 2018), and in Kenya and Nigeria promoting traditional foods [24]. The efforts help food security, maintenance of community cohesiveness and embracing and adopting healthy ways of living.

3.3 Knowledge Gaps and Future Research

Analyzing African food habits and their influence on health implies conducting local investigations as the geographical, climatic, and socio-economic differences are significant across the region. Such studies can document specific novel Diets and specific health changes, thus informing specified change strategies. Holmes et al. [18] have underlined the significance of context-specific data and intervention-oriented approaches toward the identified dietary problems of regions. Interventional and cross-sectional studies are good for identifying the short-term impact of dietary changes on health, but longitudinal designs as pointed out by Vorster et al. [20] and Kandala & Stranges [36] are critical when chronic effects on diet and health are of interest. Evidence on the efficacy of dietary interventions in Africa is scarce and hence the need for evaluation studies as highlighted by Juma et al. [34] and Matsungo & Chopera [35]. Application of agroecological practices to food systems is crucial as they may improve food security and nutrition; however, more studies are required as proposed by Ecker et al. [37] and Zhou & Staatz [38]. Examining the differences in diets in both urban and rural settings is crucial, as pointed out by Steyn et al. [26] and Peters et al. [27], to highlight the need for policies addressing nutritional challenges related to urbanization.

4. CONCLUSION

Africa continues to wrestle with the double burden of malnutrition and emerging diet-related NCDs such as obesity, diabetes and cardio vascular diseases as a result of change in the food system. These matters have been worsened by urbanization as those who dwell in the cities are prone to obesity and NCDs since they can easily access processed foods. Addressing these challenges require not only policy and intervention measures but also communal involvement and promotion of healthy diets and positive agricultural systems. Therefore, future research should embrace regional and long-term research in its attempt to establish the impact of such change on dietary pattern as well as the success of discontinued interventions. Policy action, public health intervention, community practice and research grounded on policy would assist in combating the impacts on health and the overall improvement of public health in Africa.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc) and text-to-image generators have been used during writing or editing of manuscripts.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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