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Salt Intake and Its Contribution to Hypertension in East African Communities: Dietary Patterns and Health Risks

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ABSTRACT

Hypertension is an escalating public health challenge in East Africa, significantly contributing to cardiovascular morbidity and mortality. Excessive dietary salt intake is a well-established modifiable risk factor linked to elevated blood pressure and related complications. This review examines the role of salt consumption in the rising prevalence of hypertension across East African countries, focusing on dietary patterns influenced by traditional cooking practices, urbanization, and the growing intake of processed foods. It explores the physiological mechanisms by which high sodium intake elevates blood pressure and the associated health risks including cardiovascular, renal, and maternal complications. Despite these risks, public awareness remains low and current policy interventions are limited. The review highlights significant gaps in regional data on salt consumption and the effectiveness of salt reduction strategies. It underscores the urgent need for culturally appropriate, evidence-based public health initiatives, improved food industry regulation, and standardized monitoring to reduce salt intake and mitigate hypertension-related health burdens in East Africa.

Keywords: Hypertension, Salt intake, Sodium consumption, East Africa, Cardiovascular disease, Dietary patterns.

INTRODUCTION

Hypertension, commonly known as high blood pressure, is a major public health concern globally and is increasingly prevalent in low- and middle-income countries (LMICs), including those in East Africa [1]. Defined as a persistent elevation of systolic blood pressure (≥140 mmHg) and/or diastolic blood pressure (≥90 mmHg), hypertension is often asymptomatic in its early stages earning it the moniker "silent killer" [2]. If left untreated or poorly managed, hypertension significantly increases the risk of cardiovascular diseases (CVDs), stroke, heart failure, and chronic kidney disease. According to the World Health Organization (WHO), an estimated 1.28 billion adults worldwide suffer from hypertension, with a disproportionately large share residing in LMICs where access to preventive care and treatment remains limited [3].

East Africa which includes Kenya, Uganda, Tanzania, Rwanda, Burundi, and Ethiopia is experiencing a notable epidemiological transition characterized by a shift from predominantly infectious diseases to a growing burden of non-communicable diseases (NCDs). Among these, hypertension has emerged as a critical issue [4]. Several socio-demographic and lifestyle factors are contributing to this trend: rapid urbanization, increasing sedentary behavior, poor dietary habits, rising obesity rates, alcohol consumption, and tobacco use. Of particular concern is dietary salt (sodium chloride) intake, a modifiable risk factor directly linked to elevated blood pressure [5]. The WHO recommends that adults consume less than 5 grams of salt per day. However, in many East African countries, average daily salt consumption often exceeds this threshold. The reasons for this are multifaceted. Traditional cooking methods often involve liberal use of salt and salty condiments, while urban and peri-urban populations increasingly rely on processed and fast foods that are typically high in sodium [6]. Additionally, there is limited public awareness about the health risks of excessive salt intake and a lack of clear labeling on food packaging to inform consumer choices.

Recent studies have demonstrated a strong and consistent correlation between high salt consumption and the prevalence of hypertension across various population groups. Excess sodium intake affects the renin-angiotensin system, increases vascular resistance, and leads to fluid retention—all of which contribute to sustained increases in

blood pressure [7]. Conversely, reducing salt intake has been shown to significantly lower blood pressure and, subsequently, the risk of hypertension-related complications.

Despite this established relationship, salt reduction efforts remain poorly implemented across most East African nations. Public health policies often focus on infectious diseases, with limited investment in NCD prevention and health education. Moreover, there is a paucity of region-specific data on salt consumption patterns, public perceptions, and the effectiveness of interventions aimed at lowering salt intake [8].

Hypertension is a growing epidemic in East Africa, with a significant portion of the adult population either undiagnosed, untreated, or poorly controlled. One of the key contributors to this alarming trend is excessive salt intake, yet efforts to reduce dietary sodium remain inadequate. The lack of public health campaigns, minimal regulatory action on food industries, and insufficient community awareness exacerbate the problem [9]. Moreover, most East African countries lack comprehensive national data on salt intake levels, sources of dietary sodium, and population-specific risk profiles, thereby hampering the development of targeted interventions. Without urgent action to address salt consumption, the region faces an increasing burden of preventable cardiovascular diseases and related healthcare costs [10]. The primary objective of this study is to explore the role of dietary salt intake in the increasing prevalence of hypertension in East Africa and to identify practical, population-wide strategies for reducing sodium consumption. To achieve this, the study will assess current salt consumption patterns and levels among different demographic groups in selected East African countries, examining how these patterns vary between urban and rural populations. It will also investigate the correlation between high salt intake and the incidence of hypertension and other cardiovascular diseases, drawing on both clinical and epidemiological evidence. Furthermore, the study will identify the major sources of dietary salt in both traditional and modern East African diets, including processed foods, condiments, and culturally specific cooking practices. Existing public health interventions and policies aimed at salt reduction will be evaluated to determine their reach, effectiveness, and limitations. The study will culminate in the development of context-specific, evidence-based recommendations designed to reduce salt consumption and prevent hypertension in East African populations. These recommendations will align with global public health guidelines while accounting for regional cultural, economic, and dietary factors. Guided by key research questions, including the average salt consumption in comparison to WHO recommendations and the effectiveness of current public health strategies, the study aims to contribute meaningful data that can inform future policy. Its significance lies in addressing a major, yet preventable, risk factor for non-communicable diseases. The outcomes of this research are expected to support the creation of tailored health promotion initiatives and policy interventions, such as reformulation of processed foods, nutrition labeling, and public education campaigns. Ultimately, this study will enhance efforts toward achieving the global target of a 30% reduction in population salt intake by 2025 and support Sustainable Development Goal 3: ensuring healthy lives and promoting well-being for all at all ages.

Epidemiology of Hypertension in East Africa

Hypertension has emerged as a growing public health concern across East Africa, with recent studies revealing a sharp and alarming increase in its prevalence. In Uganda, the national prevalence stands at approximately 26.4%, while in Kenya, it is estimated at around 24.5%. These figures reflect a broader regional trend where the burden of non-communicable diseases, particularly cardiovascular conditions, is steadily rising [11]. Urbanization has significantly contributed to this surge, as urban dwellers tend to adopt more sedentary lifestyles, consume diets high in salt, fat, and processed foods, and experience greater stress compared to rural populations. Consequently, urban areas consistently report higher hypertension rates than their rural counterparts. Compounding the challenge is the widespread lack of awareness about hypertension, with many individuals remaining undiagnosed until complications arise. This late diagnosis is further aggravated by limited access to healthcare facilities, inadequate screening programs, and a shortage of trained medical personnel. In addition, cultural perceptions and health literacy levels often hinder proactive health-seeking behaviors. The cumulative impact of these factors not only increases morbidity and mortality linked to hypertension but also places a heavy strain on already overstretched healthcare systems [12]. Addressing this epidemic requires robust public health strategies, community awareness campaigns, and improved healthcare infrastructure.

Salt Consumption Patterns

Salt consumption in East Africa is shaped by a combination of traditional practices and modern dietary shifts, both of which contribute to excessive sodium intake. Traditionally, salt has played a crucial role in food preservation, particularly in rural areas where refrigeration is limited. Preserved foods such as dried fish and meat are heavily salted to prevent spoilage [13]. Additionally, the use of sodium-rich condiments like "Royco" and "Maggi" cubes is widespread in-home cooking, as these flavor enhancers are deeply embedded in local culinary traditions. Fermented foods, soups, and broths common components of East African meals—also add to daily sodium intake. With the rapid pace of urbanization, dietary patterns have evolved significantly. Urban populations increasingly rely on processed and fast foods, which are often high in hidden salts. There has been a notable rise in the consumption of

bread, packaged snack foods, and instant noodles, especially among younger demographics. The expansion of supermarkets and retail chains in urban centers has further introduced a wide variety of imported processed foods with high sodium content, contributing to a shift away from traditional, whole-food diets [14]. Together, these trends pose significant public health concerns, including increased risks of hypertension and cardiovascular disease across the region.

Pathophysiology: How Salt Causes Hypertension

Excessive salt intake plays a critical role in the development of hypertension through multiple interconnected physiological mechanisms. One primary effect is fluid retention, where high levels of sodium in the bloodstream cause the body to retain water in an attempt to balance osmotic pressure. This increased fluid volume leads to an elevation in blood volume, which in turn raises blood pressure [15]. Additionally, vascular resistance is heightened due to the stiffening and narrowing of blood vessels that occurs with prolonged high salt consumption. This increased resistance forces the heart to work harder to pump blood, contributing further to elevated blood pressure levels. Salt also triggers the activation of the renin-angiotensin-aldosterone system (RAAS), a hormone system that regulates blood pressure and fluid balance. When overstimulated by excessive sodium, RAAS promotes vasoconstriction and sodium retention, worsening hypertension. Importantly, genetic predispositions particularly among individuals of African descent—can significantly increase salt sensitivity, meaning their blood pressure responds more strongly to sodium intake. This makes populations in sub-Saharan Africa especially vulnerable to salt-induced hypertension, highlighting the need for culturally tailored dietary interventions and public health policies aimed at reducing salt consumption and improving cardiovascular health outcomes in these communities [16].

Health Risks Associated with High Salt Intake

Excessive salt consumption poses significant health risks across various organ systems and life stages. One of the well-documented consequences is an increased risk of cardiovascular disease. High salt intake contributes to elevated blood pressure (hypertension), which significantly raises the likelihood of heart attacks, strokes, and other cardiovascular complications. In the kidneys, chronic hypertension induced by high sodium levels can damage the delicate renal arteries, leading to impaired kidney function and, in severe cases, chronic kidney disease or renal failure [17]. Additionally, emerging research highlights a troubling link between hypertension and cognitive decline, including a heightened risk of dementia and Alzheimer's disease, suggesting that high salt consumption may have long-term neurological consequences. For pregnant women, high salt intake can exacerbate the risk of developing pre-eclampsia a dangerous condition characterized by high blood pressure and potential damage to organ systems, which can threaten both maternal and fetal health. Infants born under such conditions may face premature birth, low birth weight, or developmental issues. Overall, the cumulative evidence underscores the urgent need for public health interventions and dietary modifications aimed at reducing salt intake to safeguard cardiovascular, renal, neurological, and maternal-child health on a population-wide scale.

Public Awareness and Health Education

Public awareness of the health risks associated with excessive salt consumption remains alarmingly low, contributing significantly to the global burden of hypertension, cardiovascular disease, and other salt-related conditions. Research indicates that many people are largely unaware of the high levels of hidden salt present in common processed and packaged foods such as bread, sauces, snacks, and ready-to-eat meals. Additionally, even when nutritional information is available, food labels are frequently overlooked, misinterpreted, or not understood due to low health literacy [18]. Cultural and habitual preferences for salty flavors further complicate efforts to encourage dietary changes, as taste expectations are often deeply ingrained from childhood. Despite the growing need for behavior change, community education campaigns and school-based interventions remain sparse, fragmented, or inadequately targeted. To reverse this trend, there is an urgent need for sustained, culturally sensitive public health initiatives that educate and empower individuals to make informed dietary choices and reduce salt intake.

Policy and Intervention Strategies

To combat the rising burden of hypertension and other salt-related non-communicable diseases (NCDs), policy and intervention strategies must be grounded in international best practices and adapted to local contexts. The World Health Organization (WHO) has set a global target of reducing population salt intake by 30% by 2025. In response, countries like Kenya and Uganda have incorporated salt reduction goals within broader NCD prevention frameworks. Global models offer valuable lessons—South Africa has enforced mandatory limits on salt content in processed foods, while the United Kingdom's voluntary salt reduction campaign resulted in a significant decline in national sodium consumption [19]. For East Africa, a multi-pronged strategy is recommended: implementing front-of-pack sodium labeling, regulating salt levels in processed products, and encouraging food manufacturers to reformulate recipes. Additionally, widespread public education campaigns using radio, television, and mobile

platforms, combined with training healthcare providers to offer dietary guidance, can help shift consumer behavior and improve public health outcomes.

Research Gaps and Future Directions

Despite growing awareness of the health risks associated with excessive dietary sodium intake, significant research gaps hinder effective intervention, particularly in low- and middle-income regions. A major limitation is the lack of comprehensive, region-wide, and standardized assessments of sodium consumption, making it difficult to accurately monitor population-level intake or track changes over time. Additionally, cultural dimensions—such as traditional food preparation methods, taste preferences, and salt-related beliefs—are poorly understood and under-researched, limiting the effectiveness of public health messaging and behavioral change strategies [20]. There is also a pressing need for biomarker-based studies, particularly those analyzing 24-hour urinary sodium excretion, which provide more accurate estimates of actual sodium intake than dietary surveys alone. Furthermore, future research should focus on evaluating the impact of context-specific educational programs and policy interventions aimed at reducing sodium consumption. Such studies are essential to develop culturally sensitive, evidence-based strategies that can be scaled to improve cardiovascular health outcomes.

CONCLUSION

The growing burden of hypertension in East African communities is closely linked to excessive salt intake, a modifiable dietary risk factor that demands urgent attention. This review highlights how traditional food practices, rapid urbanization, and increased reliance on processed foods contribute to high sodium consumption, thereby elevating the risk of cardiovascular diseases, kidney damage, and maternal complications. Despite the clear pathophysiological mechanisms connecting salt intake and hypertension, public health responses remain inadequate, hindered by low awareness, weak policy implementation, and significant research gaps. There is a critical need for region-specific strategies that integrate public education, food industry regulation, accurate monitoring of salt intake through biomarkers, and culturally informed health messaging. Multisectoral collaboration is essential to design and implement effective interventions that address both urban and rural dietary patterns. Reducing salt intake in East Africa is not only feasible but vital for curbing hypertension and achieving broader public health goals, including sustainable development and universal health coverage.

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