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Link Between Obesity and Hypertension in East African Women: A Narrative Review

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ABSTRACT

East African women are at the epicenter of a fast-moving cardiometabolic transition in which rising overweight/obesity increasingly coexists with a substantial, under-recognized burden of hypertension. This review synthesizes evidence supporting a plausible causal pathway: excess adiposity promotes sympathetic overactivity, RAAS upregulation, insulin resistance, endothelial dysfunction, renal sodium retention, and chronic low-grade inflammation mechanisms that converge to raise and sustain blood pressure. These biological risks are amplified by women's life-course exposures, including pregnancy-related weight retention and midlife shifts toward central adiposity, and by gendered constraints such as time poverty, unsafe or limited spaces for physical activity, and food environments dominated by inexpensive, energy-dense options. Cultural norms that normalize larger body size may further delay risk recognition and timely screening. We argue for an integrated, women-centered response: routine BP and adiposity screening at high-coverage touchpoints (ANC/PNC, family planning, immunization clinics), community outreach, and culturally adapted lifestyle programs emphasizing practical dietary swaps, salt reduction, and accessible physical activity. Strengthened primary-care hypertension management, task-shifting, reliable medicines, and adherence support are essential to reduce preventable CVD and intergenerational risk.

Keywords: East Africa; women; overweight/obesity; hypertension; cardiometabolic transition; RAAS; sympathetic activation; salt reduction; primary care; ANC/PNC.

INTRODUCTION

Hypertension remains one of the most important *modifiable* drivers of cardiovascular disease (CVD) globally, and its contribution to premature morbidity and mortality is especially pronounced in sub-Saharan Africa (SSA). Across many SSA settings, hypertension is increasingly diagnosed late, treated inconsistently, and controlled in only a small fraction of those affected, creating a large pool of preventable stroke, heart failure, chronic kidney disease, and ischemic heart disease. The public health implications are amplified by rapid demographic and epidemiologic transitions: populations are growing, urbanizing, and living longer, while diets, physical activity patterns, and stress exposures are shifting in ways that promote cardiometabolic risk [1]. In East Africa, these changes are unfolding alongside persistent health system constraints (limited screening coverage, fragmented follow-up, and cost barriers), producing a context where hypertension can remain silent until severe complications occur.

A central feature of this transition is the accelerating burden of overweight and obesity, particularly among women. In many urban and peri-urban communities, women are experiencing steady increases in body weight driven by reduced occupational physical activity, increased motorized transport, expanded access to processed energy-dense foods, and constrained opportunities for leisure-time exercise. Obesity is not only an independent CVD risk factor; it also interacts biologically with blood pressure regulation in ways that heighten hypertension risk. Excess adiposity contributes to insulin resistance, activation of the sympathetic nervous system, stimulation of the renin–angiotensin–aldosterone system, endothelial dysfunction, inflammation, and altered renal sodium handling pathways that collectively elevate blood pressure and sustain hypertension over time [2]. As a result, obesity and hypertension often co-occur, forming a high-risk cardiometabolic phenotype where weight gain and elevated blood pressure can reinforce each other in a damaging cycle.

Beyond biology, women's cardiometabolic risk in East Africa is shaped by gendered social realities that influence daily behavior, access to health information, and healthcare utilization. Many women experience "time poverty" due to disproportionate caregiving and household responsibilities, limiting time available for structured physical activity or self-care. Safety concerns such as fear of harassment, traffic hazards, or lack of safe recreational spaces can further restrict outdoor walking or exercise [3]. Food environments may also be unequal: in some settings, affordable options are predominantly refined carbohydrates and fried street foods, while healthier choices (fruits, vegetables, lean proteins) can be relatively expensive, seasonal, or less accessible. Additionally, cultural norms in certain communities may valorize larger body size as a marker of beauty, respectability, prosperity, or marital stability. These norms can normalize progressive weight gain and reduce urgency to recognize obesity as a health risk, thereby delaying early action to prevent hypertension [4].

The interaction of these biological and socio-cultural factors creates a critical public health challenge: women may move from normal weight to overweight and obesity during young adulthood and midlife, while simultaneously accumulating hypertension risk often without timely screening. Importantly, hypertension is frequently asymptomatic, and where routine preventive care is limited, many women may not know their blood pressure status. Even after diagnosis, treatment adherence can be undermined by medication costs, inconsistent supply, limited counseling, misconceptions about chronic medication use, and competing priorities. Consequently, the combined burden of obesity and hypertension among women can quietly expand, increasing future CVD events and straining already limited health resources [5].

In East Africa, the epidemiology of hypertension is increasingly intertwined with changing body composition patterns among women. The region has witnessed steady increases in overweight/obesity prevalence, particularly in urban and peri-urban areas where dietary transitions and sedentary lifestyles are more pronounced. Women may be uniquely exposed to these risks through pregnancy-related weight retention, hormonal transitions, and social roles that constrain activity and shape diet. At the same time, primary healthcare systems often prioritize acute and infectious conditions, leaving prevention and long-term NCD management under-resourced [6]. Community-level screening programs are not uniformly available, and where present they may have limited follow-up for confirmation, counseling, and sustained control. This environment makes it essential to generate local evidence on the relationship between obesity and hypertension among women, and to understand how socio-cultural barriers contribute to risk.

Despite hypertension being a leading and preventable cause of cardiovascular disease (CVD) in Sub-Saharan Africa (SSA), levels of awareness, treatment, and control remain persistently low across many East African settings. At the same time, overweight and obesity are rising rapidly among women, particularly in urban and peri-urban communities undergoing nutritional and lifestyle transitions. Yet, health programs often fail to address the combined burden of obesity and hypertension or the gender-specific barriers that shape women's risk exposure and delay early detection. Many women may gain weight and develop elevated blood pressure without timely screening, counseling, or context-sensitive interventions that reflect their lived realities, including time poverty, caregiving responsibilities, safety concerns, limited recreational spaces, and cultural norms favoring larger body size. This gap in risk recognition and targeted prevention threatens to accelerate hypertension-related complications and increase avoidable CVD morbidity and mortality among women. Therefore, a focused study is needed to characterize the association between obesity and hypertension among women in East Africa and to examine how gendered social and environmental constraints influence obesity-related hypertension risk, awareness, and early recognition. Generating such evidence will inform gender-responsive prevention strategies, strengthen primary care screening, guide policy and resource allocation, and ultimately reduce long-term health, social, and economic burdens.

Epidemiology in East African Women: What the data suggest

Recent national surveys and survey-linked analyses indicate that cardiometabolic risk is rising among East African women, driven in part by increasing overweight and obesity. In Uganda's UDHS 2022 key findings, women aged 15–49 years had an estimated 18% prevalence of overweight and 8.4% prevalence of obesity, showing that excess adiposity is no longer rare in reproductive-age groups. Complementary surveillance points in the same direction: comparison of Uganda's STEPS results from 2014 to 2023 shows overweight/obesity increasing from 19.3% to 24.1%, suggesting a sustained upward trajectory rather than a transient fluctuation [7]. Tanzania shows an even higher burden; analysis of the 2022 TDHS reported that women aged 20–49 years had ~36% overweight/obesity (22% overweight and 14% obese). In Kenya, DHS reporting and secondary summaries highlight pronounced socioeconomic gradients, with overweight/obesity concentrated among more educated, wealthier, urban women, patterns consistent with rapid nutrition and lifestyle transition [8]. Alongside adiposity, hypertension remains common and often under-managed: large syntheses across Africa document high prevalence with variation by age, sex, and urbanicity, and persistent gaps in detection and control, echoed in WHO country profiles and STEPS reports. Importantly, obesity and hypertension frequently co-occur and are mechanistically coupled; a large harmonized African dataset (H3Africa CHAIR; 30,044 participants from 13 countries) found obesity to be a major

correlate of hypertension, reinforcing the plausibility of the obesity blood pressure link for women in East Africa. This pairing amplifies CVD and pregnancy risks [9].

Biological pathways linking obesity to hypertension

Obesity promotes hypertension through intertwined neurohormonal, metabolic, and inflammatory pathways. Expanding adiposity raises sympathetic nervous system activity and stimulates the renin–angiotensin–aldosterone system (RAAS), increasing vasoconstriction, renal sodium and water retention, and vascular remodeling processes that sustain chronically elevated blood pressure [10]. Central obesity is also tightly linked to insulin resistance and compensatory hyperinsulinemia, which further drive sodium reabsorption, sympathetic activation, and endothelial dysfunction, thereby amplifying cardiometabolic risk. Beyond these hemodynamic effects, visceral fat behaves as an active endocrine organ, releasing pro-inflammatory cytokines and dysregulated adipokines: leptin resistance can blunt appetite regulation yet maintain pressor signaling, while reduced adiponectin weakens vascular protection [11]. The result is impaired nitric oxide–mediated vasodilation, heightened oxidative stress, and increasing arterial stiffness. In women, life-course factors modify these pathways: repeated pregnancy and postpartum weight retention can shift long-term BMI upward, and hormonal transitions such as perimenopause often redistribute fat toward the abdomen, intensifying blood pressure risk with age [12]. In East Africa, these biological risks are reinforced by urbanization and food environments favoring ultra-processed foods, sugary drinks, and fast foods, alongside constraints on safe, routine physical activity often greater for women. Cultural preferences for larger body size may also delay weight control and hypertension screening, while health-system gaps (low coverage, stock-outs, limited counseling, weak follow-up) undermine sustained control, highlighting the need for integrated, scalable community-based approaches [13].

Implications for maternal and reproductive health

Obesity-related hypertension is more than a distant cardiovascular concern; it has immediate and far-reaching implications for maternal and reproductive health. In women of reproductive age, excess adiposity promotes insulin resistance, inflammation, endothelial dysfunction, and neurohormonal activation, all of which can elevate blood pressure before conception and amplify hemodynamic stress during pregnancy [14]. Consequently, affected women face higher risks of hypertensive disorders of pregnancy including gestational hypertension and pre-eclampsia with downstream complications such as placental insufficiency, fetal growth restriction, preterm birth, and increased need for operative delivery. Beyond acute obstetric outcomes, obesity–hypertension trajectories often persist postpartum, accelerating progression to chronic hypertension, cardiometabolic syndrome, and long-term cardiovascular disease [15-20]. Importantly, maternal metabolic and vascular dysregulation may also shape the intrauterine environment, influencing fetal growth patterns, epigenetic regulation, and organ development, thereby "programming" offspring susceptibility to obesity, hypertension, and diabetes later in life. This intergenerational transmission underscores why prevention cannot be confined to adult cardiology alone. Preconception counseling, weight optimization, dietary quality improvement, physical activity support, and blood pressure screening should be integrated into reproductive health services, while antenatal care offers a high-yield platform for early identification, risk stratification, and targeted interventions that protect both mother and child [16,21-25, 26-30].

Prevention and control strategies tailored to East African women

For East African women, prevention and control of cardiometabolic risk should focus on interventions that are high-impact, feasible, and compatible with everyday constraints. First, institutionalize routine blood pressure and BMI screening across touchpoints women already use, such as antenatal care, postnatal and immunization clinics, and family planning services, while extending screening through community outreaches and workplaces such as markets, schools, and health camps. Second, implement lifestyle programs designed for limited time and resources: walking groups, church- or community-led activity sessions, and home-based routines, paired with culturally adapted nutrition counseling that emphasizes portion control, healthier cooking methods, salt reduction, and practical swaps like replacing sugary drinks with water or unsweetened options [17,31-35]. Third, integrate cardiometabolic services by bundling BP, weight, and glucose screening with counseling, reflecting evidence that multiple risk factors often cluster in the same individuals. Fourth, strengthen hypertension care within the health system through simplified treatment algorithms, task-shifting to nurses and community health workers, adherence support (reminders, peer groups), and reliable medication supply chains. At policy and environmental levels, prioritize regulation of unhealthy food marketing to children, front-of-pack labeling, healthier school food standards, safer urban walking infrastructure (lighting, sidewalks), women-friendly recreation spaces, and, where politically workable, sugar-sweetened beverage taxes alongside subsidies for healthier staples [18,36-40].

Research gaps

Key research gaps remain in understanding and preventing cardiometabolic risk, particularly hypertension, across diverse populations. First, stronger sex-disaggregated evidence is needed to clarify how specific BMI categories translate into incident hypertension over time, best generated through well-designed longitudinal cohort studies that can establish temporality and reduce reverse-causality bias. Second, routine surveillance should move beyond BMI by incorporating central obesity metrics, especially waist circumference and waist–hip ratio, because BMI may

misclassify risk and under-capture visceral adiposity that drives insulin resistance, dyslipidemia, and elevated blood pressure [19,41-45]. Third, there is limited implementation research on how to deliver integrated antenatal care (ANC) and postnatal prevention packages that combine screening, counseling, referral pathways, and follow-up, alongside scalable community blood pressure control models that leverage task-shifting, home BP monitoring, and linkage to primary care. Finally, prevention strategies are unlikely to succeed without addressing context: rigorous socio-cultural intervention trials are required to test approaches that engage body image norms, social desirability of larger body size, and household decision-making dynamics that shape diet, physical activity, care-seeking, and adherence to long-term risk reduction [20, 46-50].

CONCLUSION

East African women are at the epicenter of a rapidly evolving cardiometabolic transition in which rising overweight/obesity is increasingly coupled to a substantial, often under-recognized burden of hypertension. Evidence synthesized in this review supports a coherent causal pathway: excess adiposity drives sympathetic activation, RAAS upregulation, insulin resistance, endothelial dysfunction, renal sodium retention, and chronic low-grade inflammation mechanisms that converge to elevate and sustain blood pressure. These biological risks are intensified by women's life-course realities, including pregnancy-related weight retention and midlife shifts toward central adiposity, alongside gendered constraints such as time poverty, unsafe or limited spaces for physical activity, and food environments dominated by inexpensive, energy-dense options. Cultural norms that normalize larger body size can further delay risk recognition and timely screening. Given these intersecting drivers, the most feasible response is an integrated, women-centered approach: routine BP and adiposity screening at high-coverage touchpoints (ANC/PNC, family planning, immunization clinics), community-based outreach, and culturally adapted lifestyle programs that prioritize practical dietary swaps, salt reduction, and accessible physical activity. Strengthening primary-care hypertension management task-shifting, reliable medicine supply, and adherence support will be essential to reduce preventable CVD and intergenerational risk.

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