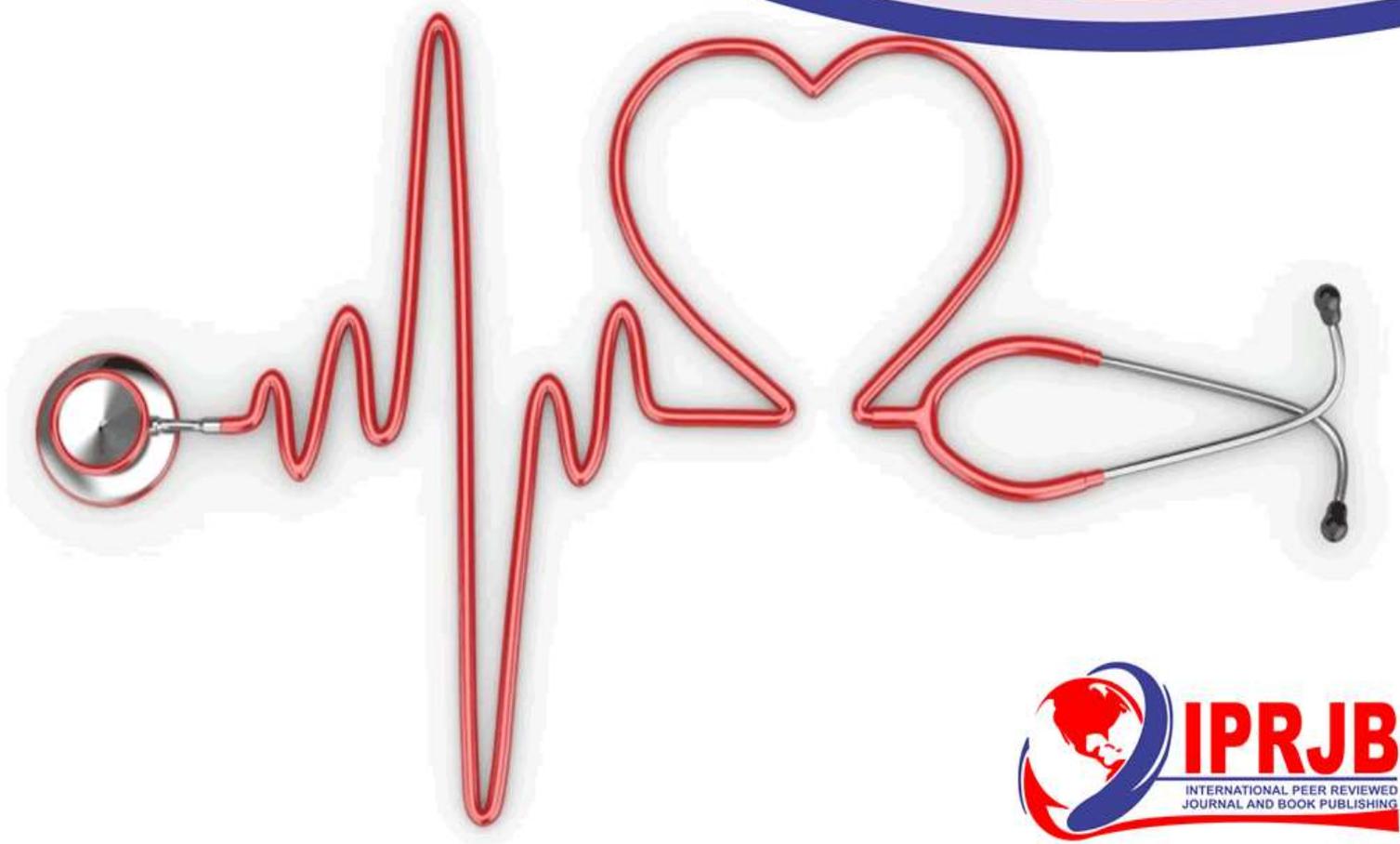


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**Prevalence and Barriers to Hypertension Management among Residents in Hagadera  
Refugee Camp (Kenya)**

Kiogora John A., Dr. Daniel Nyamongo Sagwe and Dr. Rose Bosire



**Prevalence and Barriers to Hypertension Management among Residents in Hagadera Refugee Camp (Kenya)**



Kiogora John A.<sup>1\*</sup>

Jomo Kenyatta University of Agriculture and Technology



Dr. Daniel Nyamongo Sagwe<sup>2</sup>

School of Public Health, Jomo Kenyatta University of Agriculture and Technology



Dr. Rose Bosire<sup>3</sup>

Lecturer, KEMRI

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**Abstract**

**Purpose:** This study aims to investigate the prevalence of hypertension and explore the barriers to effective management among adult refugees residing in Hagadera Refugee Camp, Kenya.

**Methodology:** A descriptive cross-sectional study using a mixed-methods approach was employed in Hagadera Refugee Camp (N = 39,264) to assess hypertension prevalence and barriers to its management. The quantitative phase included a survey of 422 randomly selected participants, with data collected through semi-structured questionnaires based on the WHO STEPS tool. Qualitative data were obtained through semi-structured interviews (Key Informant Interviews [KIIs]) and Focus Group Discussions (FGDs) to gather in-depth insights on healthcare access, barriers to treatment, and patient experiences. The mixed-methods approach employed concurrent triangulation, where both data types were analyzed separately and then compared for triangulation. Quantitative data were analyzed using SPSS version 25, while qualitative data were transcribed and analyzed thematically using NVivo 10.

**Findings:** The study found that the overall prevalence of hypertension among the sample population was 6.8%. Hypertension was more prevalent among males (4.8%) compared to females (1.9%) (Chi=12.27, p-value<0.01), and more common in individuals aged 55 years and above (3.2%) compared to younger age groups (Chi=32.56, P-value<0.00). The highest prevalence was observed among the unemployed (4.3%) and those with no formal education (4.6%). Key barriers identified included limited healthcare resources (medications and diagnostic tools), healthcare staff shortages, poor infrastructure (e.g., long distances to clinics), and low health literacy. Additionally, repatriation and population mobility were significant barriers to continuity of care. Ethical considerations were carefully followed, ensuring informed consent from all participants and maintaining participant confidentiality.

**Unique Contribution to Theory, Policy and Practice:** This study contributes to the understanding of NCD management in protracted humanitarian settings by demonstrating that traditional emergency-focused health models are insufficient for chronic conditions like hypertension, which require sustained, integrated chronic care. It highlights the “double burden of disease” in refugee camps and the specific challenges posed by encampment policies and parallel health structures.

**Keywords:** Hypertension Management, Refugees, Health Systems, Health Literacy, Non-Communicable Diseases

**JEL Codes:** I12, I14, I15, J15

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## INTRODUCTION

The global burden of hypertension remains significant. According to the Global Burden of Disease (GBD) study, the number of adults aged 30–79 years living with hypertension worldwide rose from approximately 650 million in 1990 to 1.4 billion in 2024, representing about 33% of this age group(1). Two-thirds of those affected reside in low- and middle-income countries (LMICs). Hypertension continues to rank as a leading modifiable risk factor for cardiovascular disease, contributing to millions of deaths and disability-adjusted life years (DALYs) annually, with high systolic blood pressure as the primary driver (2).

High blood pressure serves as the leading single risk factor for the global burden of disease in most regions. In sub-Saharan Africa (SSA), including many refugee-hosting areas, an epidemiological transition is underway (3). While communicable diseases such as malaria, HIV, and tuberculosis have historically dominated, non-communicable diseases (NCDs) like hypertension are rapidly rising, creating a "double burden of disease"(4). This coexistence strains already fragile health systems in refugee settlements, where both infectious and chronic conditions compete for limited resources. Evidence indicates that hypertension complications are growing among refugees, exacerbated by disrupted continuous care, stress, poor nutrition, and limited access to preventive services (5).

Additionally, refugee camps carry disproportionate economic, social, and educational burdens that render behavioural changes for health enhancement, such as physical activity daunting (4). Indeed, due to numerous challenges, refugees may not be able to avoid lifestyles and dietary habits that minimize the risk of NCDs, especially hypertension (5). Further, many refugees do not seek care because they lack sufficient knowledge about where to get assistance or do not perceive themselves as sick enough to call for physicians' attention and the related costs (6).

The prevalence of non-communicable diseases is on the rise in developing countries where most refugee settlements are characterized by high prevalence and incidence of communicable diseases (7). As a result, NCDs such as HTN, are quickly surpassing the burden of communicable diseases in terms of morbidity and mortality (8). According to the World Health Organization, the prevalence of hypertension has increased by 12% between 2010 and 2016 (9). In high income countries, migrants as well as refugees of African, black African-Caribbean and Asian Indian origin were found to have higher indexes of obesity, blood pressure, cholesterol levels, blood glucose levels, and present as more insulin-resistant as compared non-migrant family members residing in their native homes (10).

The prevalence of hypertension is higher in low and middle-income countries and affects compared to high income countries. Research also shows that hypertension mortality rates are higher in LMICs than European countries (141 versus 93 per 10000, respectively) (11). According to the annual report of the Organization for Economic Co-operation and Development (12), a prevalence of 56% with 10% self-reported cases of heredity history hypertension was recorded among Ethiopian refugees (13). The UNHCR reported high rates of hypertension among refugees hosted in Chad. From the assessment, 84% (343) of the respondents were found to be hypertensive, 22% (113) were found to have pre-hypertension, and 2% (8) reported a history of myocardial infarction or angina (5).

Hypertension management in general has been a growing concern worldwide, especially in low- and middle-income countries (LMICs). While healthcare systems in these countries face numerous challenges, the management of non-communicable diseases (NCDs), including hypertension, is hindered by limited resources, inadequate healthcare infrastructure, and

insufficient health personnel (1). In Kenya, the management of NCDs is outlined in several national policies and guidelines. The Kenya National Strategy for the Prevention and Control of Non-Communicable Diseases (2015-2020) and the Kenya Health Policy 2014-2030 both emphasize the importance of addressing hypertension through prevention, early detection, and treatment strategies. These policies are aligned with the World Health Organization's (WHO) global strategy for the prevention and control of NCDs. However, despite these policies, access to hypertension care remains a challenge, especially for vulnerable populations such as refugees.

Healthcare in Kenya is a devolved function, primarily managed at the county level. In contrast, refugee camps such as Hagadera fall under the management of the United Nations High Commissioner for Refugees (UNHCR) in partnership with humanitarian organizations. This parallel structure can create coordination challenges. Additionally, Kenya's encampment policy has historically restricted refugees' freedom of movement, requiring special permits to leave camps for specialized care (e.g., at national referral hospitals for hypertension complications). The Kenya Refugee Act 2021 seeks to improve integration by granting greater rights, including potential access to work, financial services, and broader health services, while maintaining designated settlement areas (14). Full implementation could help bridge gaps, but structural barriers to seamless integration with county and national health systems remain.

The Dadaab Refugee Complex, established in 1991 to host Somali refugees fleeing conflict and environmental challenges, is one of the world's largest and most protracted refugee situations. Hagadera Camp, one of its main sections, currently houses tens of thousands of residents, many of whom have lived there for decades (including second- and third-generation refugees)(14). This long-term displacement has resulted in an aging population within the camp, increasing susceptibility to hypertension and other NCDs due to cumulative exposure to risk factors such as stress, limited livelihood opportunities, and dietary shifts in a resource-constrained environment.

This study seeks to fill existing knowledge gaps by examining the prevalence of hypertension among adult refugees in Hagadera Refugee Camp and the specific barriers to its effective management. It also assesses how national NCD policies and the Refugee Act 2021 translate into practice within the camp setting, highlighting opportunities for better alignment and integration of refugee health services.

### **Objectives**

The main objective of this study is to determine the prevalence of hypertension among adult refugees in Hagadera Refugee Camp, Kenya, and identify the barriers to its effective management.

### **Specific objectives**

- i. To determine the prevalence of hypertension among adult refugees in Hagadera refugee camp, Kenya
- ii. To identify the socio-economic barriers to hypertension health care management among the refugees in Hagadera refugee camp, Kenya.
- iii. To determine the health facility barriers to hypertension health care management among the refugees in Hagadera refugee camp, Kenya.

## **METHODOLOGY**

This study employed a mixed-methods design, combining both descriptive cross-sectional and qualitative approaches to provide a comprehensive understanding of hypertension prevalence and management barriers among adult refugees in Hagadera Refugee Camp. The combination of these methods was essential to triangulate quantitative findings with qualitative insights and provide a deeper understanding of the contextual barriers to hypertension management in a refugee setting. The descriptive cross-sectional approach allowed for an accurate assessment of hypertension prevalence, while the qualitative approach provided rich data on the personal and systemic barriers to healthcare access and hypertension treatment.

The study was conducted in Hagadera Refugee Camp, part of the larger Dadaab Refugee Complex in Garissa County, Kenya. Dadaab is one of the largest refugee settlements in the world, hosting refugees primarily from Somalia, with a population of over 200,000 individuals across multiple camps. Hagadera camp, one of the five camps within the complex, houses approximately 39,264 individuals, with a mixed population of males and females, most of whom are displaced due to conflict and environmental factors in Somalia. Healthcare services in the camp are provided by the United Nations High Commissioner for Refugees (UNHCR) in collaboration with local and international non-governmental organizations.

A stratified random sampling method was employed to ensure representation across different demographic strata of the camp. This involved dividing the camp population into strata based on geographic zones (camp sections) and key socio-demographic characteristics such as age, gender, and employment status. These strata were informed by existing demographic data provided by the UNHCR and were intended to capture a diverse sample reflective of the camp's population.

The sample size was determined using an epidemiologic formula for cross-sectional studies, based on a 50% estimated prevalence ( $p = 0.5$ ), a 95% confidence interval ( $Z = 1.96$ ), and a 5% margin of error ( $d = 0.05$ ), resulting in a sample size of 422 participants. To account for a 10% non-response rate, the final sample size was adjusted to 422.

The sampling frame consisted of a list of eligible adult residents of Hagadera Refugee Camp, compiled in collaboration with local community health workers (CHWs) and the UNHCR camp administration. The list was based on registration data provided by the UNHCR, which included all adults living in the camp. Within each identified stratum, participants were randomly selected from this list. The process of creating the list and assigning individuals to strata was informed by camp demographic data and the stratification criteria outlined above.

Data collection was conducted by a team of trained enumerators under the supervision of the research team. Quantitative data were collected using semi-structured questionnaires, based on the WHO STEPS tool for non-communicable diseases (NCDs). This tool was administered using the Kobo Collect platform, ensuring data integrity and minimizing errors. The questionnaires were designed to capture information on hypertension prevalence, socio-demographic factors, and self-reported health conditions.

Qualitative data were gathered through Focus Group Discussions (FGDs) and Key Informant Interviews (KIIs). FGDs were conducted with hypertensive patients, caretakers, and community health volunteers (CHVs) to explore the lived experiences of those affected by hypertension and to identify barriers to management. KIIs were conducted with health staff,

including clinical officers, nursing officers, and administrative personnel, to understand the healthcare system's response to hypertension in the camp.

Interviews were conducted in English or Somali languages, based on the participant's preference. All interviews were audio-recorded with participants' consent, and field notes were also taken to complement the recorded data.

To ensure the quality of the data, several measures were implemented: Enumerators were trained on data collection procedures, including how to conduct the interviews, maintain confidentiality, and handle sensitive topics. The questionnaires were pre-tested in a similar setting to ensure they were understandable and culturally appropriate. A supervisory team monitored the data collection process, checking for consistency and completeness in the collected data. All collected data were reviewed daily to identify any issues early in the process, allowing for corrective action.

Quantitative data were analyzed using SPSS version 25 to perform descriptive statistics, chi-square tests, and logistic regression. These analyses helped determine the prevalence of hypertension and identify associations between demographic characteristics and hypertension.

For qualitative data, NVivo 10 software was used to conduct thematic analysis. The transcripts were coded in an iterative process, starting with an open coding phase to identify initial themes. A deductive coding framework was used based on key themes related to barriers in hypertension management identified in the literature. Following initial coding, the research team met to discuss emerging themes and ensure consistency across the data. Peer debriefing and triangulation were also employed to ensure the validity and reliability of the findings.

Ethical approval for this study was obtained from the Kenya Medical Research Institute (KEMRI) (Approval number KEMRI/RES/2023/0128). The study adhered to the following ethical principles: Informed consent was obtained from all participants, explaining the purpose of the study, the voluntary nature of participation, and their right to withdraw at any time without consequence. Participants' privacy and confidentiality were maintained throughout the research process, with all data anonymized before analysis. Participants were assured that the findings would be used for research purposes only and that no identifying information would be published.

## RESULTS

### **Prevalence of Hypertension among Adult Refugees in Hagadera Refugee Camp (Dadaab) in Kenya**

The prevalence of hypertension in the sample population was 6.8%. The prevalence of hypertension as indicated in the table 1 below was high in males at 4.8% while in females it was 1.9% (Chi=12.27, p-value<0.01). The prevalence of hypertension was highest among those who were 55 years and above at 3.1%, followed by those who were between 45-54 years at 2.2%, followed by respondents who were 35-44 years at 0.7% followed by those who were 15-24 years at 0.5% and least among those who were between 25-34 years at 0.2% (Chi=32.56, P-value<0.00). The prevalence of hypertension based on the employment status of the respondents was highest among the unemployed at 4.3%, followed by the employed at 1.4% and was least among those who reported to be self-employed at 1%. Hypertension was significantly associated with the occupation of the participants (p-value<0.04).

The prevalence of hypertension was highest among the uneducated at 4.6%. Results for test of association between education level and hypertension are not statistically significant (p-

value=0.16). Hypertension prevalence was highest among the married at 4.1%, followed by the divorced at 1.4% and those who never got married at 0.7% (p-value=0.04). The prevalence of hypertension was highest among the high earners at 4.6% and low among those who reported to earn less than Kshs.5000 at 2.2%. (p-value=0.48).

**Table 1: Cross Tabulation of Hypertension Prevalence against Selected Socio-Demographic Factors**

	Hypertensive		Non-Hypertensive		P-value
	N	%	N	%	
<b>Sex</b>					
Female	8	1.9	240	58	
Male	20	4.8	146	35.3	
<b>Total</b>	<b>28</b>	<b>6.8</b>	<b>386</b>	<b>93.2</b>	<b>*0.00</b>
<b>Age</b>					
15-24	2	0.5	58	14.0	
25-34	1	0.2	126	30.4	
35-44	3	0.7	96	23.2	
45-54	9	2.2	44	10.6	
55+	13	3.2	62	15.0	
<b>Total</b>	<b>28.0</b>	<b>6.8</b>	<b>386.0</b>	<b>93.2</b>	<b>**0.00</b>
<b>Occupation</b>					
Employed	6	1.4	132	31.9	
self employed	4	1	102	24.6	
Unemployed	18	4.3	152	36.7	
<b>Total</b>	<b>28</b>	<b>6.8</b>	<b>386</b>	<b>93.2</b>	<b>*0.04</b>
<b>Education Level</b>					
College/University	0	0	1	0.2	
None	19	4.6	176	42.5	
Primary	7	1.7	168	40.6	
Secondary	2	0.5	41	9.9	
<b>Total</b>	<b>28</b>	<b>6.8</b>	<b>386</b>	<b>93.2</b>	<b>0.16</b>
<b>Marital Status</b>					
Currently married	17	4.1	238	57.5	
Never married	3	0.7	82	19.8	
Separated	1	0.2	22	5.3	
Cohabiting	0	0	3	0.7	
Divorced	6	1.4	22	5.3	
Widowed	1	0.2	19	4.6	
<b>Total</b>	<b>28</b>	<b>6.8</b>	<b>386</b>	<b>93.2</b>	<b>*0.04</b>
<b>Income</b>					
0-5000	9	2.2	105	25.4	
>5000	19	4.6	281	67.9	
<b>Total</b>	<b>28</b>	<b>6.8</b>	<b>386</b>	<b>93.2</b>	<b>0.48</b>

**Note:** This cross-tabulation excludes people who refused to comment or some missing responses, thus the total stands at 414. So, the 414 had complete responses on these questions.

\* Implies sig at 0.05 level, \*\* implies sig at 0.01 level

## **Socio-economic Barriers to Hypertension Management among the Refugees in the Hagadera Refugee Camp (Dadaab) in Kenya**

Participants identified a range of factors impeding effective hypertension management in the camp. These spanned individual behaviors, logistical challenges, systemic healthcare limitations, and contextual vulnerabilities associated with displacement.

### **a) Limited Health Literacy and Patient Engagement**

Low levels of health literacy were a dominant theme, affecting patients' understanding of hypertension as a chronic, often asymptomatic condition. Many patients were unaware of the need for consistent medication even in the absence of symptoms. While CHVs and healthcare providers attempted to raise awareness, these efforts were often insufficient due to literacy challenges and language barriers.

A 55-year-old clinical officer noted:

*“We often see patients return only when they have severe complications because they did not feel sick and thought it was unnecessary to come back for drugs.”*

This illustrates the gap between hypertension education and patient behavior, reinforcing the need for simplified and tailored health messaging.

### **b) Logistical and Environmental Constraints Affecting Access to Care**

Participants across FGDs described the harsh terrain, long distances to the NCD clinic, and extreme weather conditions as significant barriers to seeking care. These physical challenges were compounded by insecurity and lack of transportation, discouraging regular follow-up visits—especially for the elderly and physically unwell.

In one FGD, several participants echoed sentiments such as:

*“Sometimes it’s too far and too hot. If you go and there’s no medicine, you just stay home next time.”*

These logistical issues are not only infrastructural but contribute to health-seeking fatigue and disengagement from care.

### **c) Human Resource Shortages and Service Overload**

Key informant interviews with healthcare staff revealed that staffing levels at the NCD clinic were critically low. On many days, only one clinician managed all hypertensive and chronic disease cases, resulting in long queues, rushed consultations, and delayed services.

A nursing officer shared:

*“We are overwhelmed. Sometimes, the queue is so long that we can’t finish by the end of the day, and patients are turned away.”*

This shortage of personnel leads to poor patient-provider interaction and compromised quality of care.

### **d) Inconsistent Medication and Supply Chain Gaps**

Both FGDs and KIIs confirmed frequent stock-outs of antihypertensive medications and lack of essential diagnostic tools. These disruptions erode patient trust and contribute to poor adherence.

A CHW supervisor, supported by others in the FGD, stated:

*“When we don’t have drugs for weeks, we lose patients to follow-up. They feel discouraged and don’t trust the system anymore.”*

This barrier reflects the fragility of donor-dependent supply chains in humanitarian settings.

#### **e) Poor Patient-Centered Communication and Follow-Up Systems**

Participants in multiple FGDs expressed dissatisfaction with how care was delivered. They reported that clinicians often failed to explain treatment regimens or provide updates on blood pressure status, leading to confusion and lack of ownership over their health.

One female participant voiced:

*“They don’t even explain the drugs or what is happening with my blood pressure. They just write and tell me to go.”*

This points to the need for improved communication strategies and a more respectful, patient-centered care model.

#### **f) Lack of Diagnostic and Decentralized Services**

KIIs revealed that the clinic relied almost exclusively on BP measurements, with limited or no access to ECGs, renal function tests, or lipid profiles. Furthermore, community health posts did not provide NCD care, requiring patients to travel to the central facility.

One key informant summarized:

*“We are only treating numbers. Without proper investigations, we can’t manage these patients holistically.”*

This lack of diagnostic support limits clinical decision-making and comprehensive care.

#### **g) Patient Displacement and Interruption of Care**

Another theme that emerged strongly in KIIs was the impact of refugee mobility and repatriation. Patients frequently moved between camps or returned to Somalia, leading to interrupted treatment, lost medical records, and failure to complete long-term care plans.

Health workers noted that:

*“Repatriation affects follow-up. We can’t trace patients, and they often return to care with worse conditions or not at all.”*

This barrier reflects the instability of care in humanitarian contexts where movement is common and systems are not interoperable.

### **Discussion**

This study aimed to assess the prevalence of hypertension and explore the barriers to its management among refugees in Hagadera Refugee Camp, located in the Dadaab Refugee Complex, Kenya. The prevalence of hypertension was found to be 6.8% in the study population, a figure that is within the range reported in similar refugee settings, though it is lower than that seen in other regions such as Norway and the United States, where prevalence rates among Somali immigrants were much higher, at 43% and 30%, respectively (15) (16) (17). This discrepancy may be attributed to varying health system capacities, cultural differences, and the socio-economic contexts in which refugees reside. The findings from this study suggest that while hypertension is a significant health concern among refugees, it may be less prevalent in Hagadera compared to other settings, which could be due to differences in

healthcare infrastructure, access to early screening, and intervention efforts in those respective countries.

In terms of socio-demographic factors, the study found that hypertension was more prevalent among males, the unemployed, those with lower education levels, and older adults, consistent with trends observed in other global studies (18), (14). Specifically, the highest prevalence of hypertension was observed among individuals aged 55 years and above, which aligns with global trends indicating that hypertension is more common among older populations. The study also found that the prevalence was significantly higher among the unemployed, which is consistent with studies indicating that lower income and unemployment are often associated with higher rates of hypertension (19). This is likely due to the combination of poor access to healthcare, increased stress, and limited ability to afford healthy lifestyle choices, such as nutritious food and physical activity. Conversely, the prevalence among those with secondary and higher education levels was lower, although this was not statistically significant. This finding suggests that education may play a role in hypertension awareness, but its impact on health outcomes may be overshadowed by other socio-economic factors.

Beyond quantifying the prevalence of hypertension, this study highlighted several key barriers to hypertension management that are particularly relevant in the refugee camp setting. These barriers were identified through both quantitative measures and qualitative interviews, providing a comprehensive view of the challenges refugees face in managing chronic diseases like hypertension. One of the most significant barriers identified was low health literacy. Many refugees in Hagadera lacked sufficient knowledge about hypertension, including its asymptomatic nature and the importance of continuous treatment. This aligns with findings from other studies, which have consistently shown that poor health literacy is associated with lower adherence to prescribed treatment regimens and poor management of chronic diseases (18). In this study, healthcare workers expressed frustration that patients often did not return for follow-up visits until they experienced severe complications, such as stroke or heart failure. This is indicative of a broader issue of understanding hypertension as a chronic condition that requires long-term management, rather than a short-term illness that can be treated with a single visit.

Additionally, logistical challenges were found to be a major barrier to accessing healthcare in the camp. Refugees reported that long distances to the clinic, compounded by poor infrastructure and the harsh environmental conditions, made it difficult to attend regular follow-up appointments. This barrier disproportionately affected elderly patients and those with limited mobility. These logistical issues are consistent with findings from other refugee settings, where the physical barriers to accessing care, such as long travel distances and lack of transportation, are major determinants of healthcare utilization. The impact of geographical access on healthcare outcomes has been well-documented, with studies showing that patients in remote areas are less likely to adhere to treatment regimens, leading to poorer health outcomes.

The study also found that staffing shortages and underfunding were significant barriers to hypertension management. The NCD clinic in Hagadera was often understaffed, with only one clinician available to handle all the NCD patients. This resulted in long wait times, rushed consultations, and delays in diagnosis and treatment. This finding is consistent with other studies conducted in refugee camps and low-resource settings, where chronic staff shortages are a persistent issue. Inadequate staffing has been shown to lead to suboptimal patient care, as

clinicians are unable to provide adequate education, follow-up, or comprehensive care for patients with complex conditions like hypertension. Moreover, the shortage of antihypertensive medications and diagnostic equipment in the clinic further exacerbated the problem, as patients were either unable to receive their prescribed medications or were given incomplete treatment regimens. These supply chain issues reflect the challenges of delivering consistent and high-quality healthcare in humanitarian settings, where resources are often limited and unstable.

Another significant barrier identified in this study was the lack of patient-centered communication and poor follow-up systems. Many patients reported that healthcare providers did not explain their treatment regimens or the importance of controlling their blood pressure. This lack of clear communication and engagement from healthcare providers is a well-established barrier to hypertension management. Studies have shown that patients who feel uninvolved in their treatment process are less likely to adhere to prescribed therapies, leading to poorer health outcomes (19). This finding highlights the importance of adopting a more patient-centered approach in refugee health settings, which includes better communication, education, and involvement of patients in the decision-making process regarding their care.

The impact of refugee mobility and repatriation on continuity of care was another major theme that emerged from this study. Refugees often move between different camps or return to their home countries, leading to interruptions in their treatment and the loss of medical records. This movement disrupts the continuity of care and makes it difficult for health workers to track patient progress and provide consistent treatment. This finding is consistent with studies conducted in other refugee populations, where displacement and lack of a stable healthcare system complicate chronic disease management. Moreover, the absence of interoperable health information systems between camps and host countries further exacerbates this issue, as patient records are often lost or inaccessible. The disruption caused by repatriation and mobility reflects the broader instability of healthcare delivery in refugee settings, where patient continuity is often compromised.

## **CONCLUSION AND RECOMMENDATIONS**

### **Conclusion**

This study demonstrates that hypertension represents a notable and growing health challenge among refugees in Hagadera Refugee Camp, where effective long-term management is severely undermined by interconnected socio-economic, logistical, and health system barriers. These include low health literacy (particularly regarding the asymptomatic and chronic nature of the condition), human resource shortages, inconsistent medication supplies, poor infrastructure, limited diagnostic capacity, and disruptions caused by population mobility and repatriation.

The findings underscore a critical systemic issue in humanitarian settings: traditional health responses remain largely oriented toward acute care and emergency management of communicable diseases. This "acute" model proves inadequate for addressing NCDs such as hypertension, which require sustained continuity of care, regular monitoring, patient education, and lifestyle support over years or decades. In protracted refugee situations like Dadaab the failure to transition toward integrated chronic care models leads to poor adherence, high loss to follow-up, increased complications (such as cardiovascular events), and avoidable morbidity and mortality.

The key implication is that humanitarian actors, governments, and partners must accelerate the shift from episodic, crisis-driven responses to robust, patient-centered chronic care frameworks for NCDs. This includes embedding hypertension management within strengthened primary health care systems, as advocated in global guidance from UNHCR, WHO, and the Informal Inter-Agency Group on NCDs in Humanitarian Settings.

### **Recommendations**

Based on the conclusions of this study, it is recommended that health literacy programs be enhanced, focusing on the chronic nature of hypertension and the need for continuous treatment. This can be achieved through tailored education initiatives and training community health workers. Staffing shortages should be addressed by increasing healthcare personnel and providing ongoing training. Ensuring a consistent supply of medications through reliable supply chains is crucial. Decentralizing services by establishing satellite health posts in various camp zones will improve access to care. Additionally, improving patient-centered communication and providing regular follow-ups will enhance adherence to treatment. A comprehensive health information system is needed to ensure continuity of care despite refugee mobility. Finally, long-term monitoring and evaluation of these interventions will ensure their effectiveness and sustainability.

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