

Determinants of Accessibility of Hypertensive Drugs by Adult Patients Under Sustainable Development Goal Three in Nairobi City County, Kenya

Dianah Kathambi Riungu¹, Patrick Mbataru²

¹Master of Arts in Public Policy and Administration of Kenyatta University, Kenya

²Department Of Public Policy and Administration, Kenyatta University, Kenya

ABSTRACT

Hypertension is noted to be the easiest non-communicable disease to diagnose treat and monitor if proper health systems are put in place to ensure hypertensive drugs are accessible to hypertensive patients who need them daily. It is estimated that prevalence rate of hypertension in Kenya range from 13 % to 50 % and only 1 in 5 of the diagnosed are on hypertensive medicines. Lack of medication intake leads to uncontrolled hypertension resulting to more serious health complications which result to premature deaths. Previous studies have provided little information on the determinants of hypertensive drugs accessibility to patients. An enquiry on the availability of hypertensive drugs in public hospitals is worthwhile because hypertension has become an important social problem. This study has investigated the determinants of accessibility of hypertensive drugs by adult patients who are supposed to have uninterrupted medication intake for a healthy living. The concept of essential drugs was adopted for this study. This concept of essential drugs contained essential medicines list (EML) and the eight elements of primary health care of 1978 with a goal to ensure equal access to medicines. Descriptive design has been adopted for the study. The targeted population of 6329 hypertensive patients in public health facilities within Nairobi County. Yamane formula was used to get the sample size, which will be a total of 394 patients. Systemic random sampling procedure was employed for the study. A questionnaire tool of data collection was used for data collection. The collected data was there after coded and analyzed using Statistical Package for Social Sciences (SPSS) both for descriptive statistics (frequencies and percentages) and inferential statistics (correlation analysis). Data is presented using pie charts tables and figures. The study revealed that accessibility of medication in Nairobi city county health facilities is contributed by lack of medication in the facilities.

Key Words: Hypertensive Drugs, Adult Patients, Sustainable Development Goal

DOI 10.35942/ijcab.v5i4.214

Cite this Article:

Riungu, D., & Mbataru, P. (2021). Determinants of Accessibility of Hypertensive Drugs by Adult Patients Under Sustainable Development Goal Three in Nairobi City County, Kenya. *International Journal of Current Aspects*, 5(4), 108-119. <https://doi.org/10.35942/ijcab.v5i4.214>

1.0 Introduction

Sustainable development goal three focus on ensuring that people have health lifestyles. It also to promote wellbeing for all. The United Nations Summit on Sustainable Development in September 2015, recognized non-communicable diseases (NCDs) as a challenging factor in sustainable development. NCDs were not addressed in the Millennium Development Goals (MDGs). United Nations highlight that it is the responsibility of every government to develop a national response for overall implementation of this Agenda by coming up with policies that provide measures for

easy accessibility to essential drugs. This has emerged a critical issue in the global health sectors. Without understanding the determinants of accessibility of drugs, it becomes difficult to manage critical illnesses like hypertension. Hypertension is a non-communicable disease globally responsible for two thirds of deaths worldwide. 80 percent of deaths are in low to middle income countries (WHO, 2015). According to WHO, hypertension cases are on the rise worldwide and the number of uncontrolled HTN in-patients has increased from approximately 600 million in 1980 to almost 1 billion in 2008. It is further highlighted that in 2009. Hypertension caused the highest number of deaths than any other non-communicable disease (Magnusson, 2014).

American Heart Association affirms that, hypertension affects 1 out of every 3 adults in the United States. It is also noted by The Action Plan for implementation of the European Strategy for the Prevention of Non communicable Diseases 2012-2016 that non communicable diseases (NCDs) accounts for 86% of all deaths and 77% of the disease burden in Europe. Asia Pacific cohort study (APCSC) which consists of thirteen Chinese populations states agree that hypertension was closely associated with the risk of stroke and ischemic heart disease and that the link between elevated BP and stroke events in Asian populations was stronger than in Australia and New Zealand populations. The risk of stroke and fatal myocardial infarction increased by 53.2% and 31.7% respectively in Asian populations, while by 23% and 21% respectively in Australian and New Zealand populations (Lawes CM, 2013).

According to India's census 2018 report, there is a high prevalence of hypertension among Indian adults, with almost one in three adults living with hypertension. Around 762 million Indians are above 18 years of age, which means that there are currently 234 million adults with elevated blood pressure. Hypertension is not only a global health burden but it also imposes heavy financial load (Constant AF, 2016). Lower-socioeconomic groups and urban populations face higher risks because of factors associated with sedentary lifestyles: lack of body exercise, unhealthy diet, increased tobacco, and alcohol consumption (Hosseinpoor A.R, 2012). Hypertension is noted to be a chronic non-communicable disease that can be easily treated since diagnosis is done by measuring and monitoring of the disease is easy. Drug regimens can be as low as one tablet a day. In addition laboratory monitoring is not needed when treating hypertension, yet the condition is adequately and effectively controlled in only about 14 % of the patients worldwide (Chow CK, 2013). Programs to treat chronic diseases such as antiretroviral treatment for HIV, which is to some extent more expensive than hypertension treatment, has been successfully scaled up to reach at least 38% of HIV-infected persons who are eligible for treatment in low middle-income countries, LMICs (UNAIDS, 2014). Therefore this suggests that expansion of treatment and control of hypertension in LMICs should be achievable (Bibbins-Domingo K, 2010).

Hypertension in Africa, was non-existent early in the twentieth century. Yet current studies show that sub-Saharan Africa (SSA) has the highest prevalence of hypertension in the world today reaching approximately 32% (Ataklte F, 2014). Under prevailing circumstances, the number could increase to 216.8 million by 2030, if the current trends hypertension prevalence remain unchanged in sub Saharan Africa (Wagirumukiza M, 2011). WHO highlights that in Africa 54 % of women were aware of their condition than men and more than half of them were undergoing treatment and controlled blood pressure (WHO, 2017). Notably, the difference in preference between men and women could be related to the higher levels of employment for men, who subsequently had limited access to health care services outside their working hours (WHO, 2010), as well as working related stress.

A study conducted in both Uganda and Tanzania reported that, the inadequacy of hypertension medications and equipment for diagnosis in hypertension management or treatment negatively impacts the health-seeking behavior of hypertensive patients (Thorogood M, 2007). Basic supplies were absent in a number of lower-level health facilities where many patients reside in Tanzania (Peck R, 2014). It was further noted that patients with high blood pressure were given medicines for a fortnight and asked to return for follow-up. The decision was not only based on a monitoring strategy but also due to the inadequate drugs available and hence this was a strategy to minimize stock out (Whyte SR, 2014). In Uganda, hypertension has contributed to a high burden than any other non-communicable disease because of the high numbers of hypertension patients. For example, Uganda national referral hospital, hypertension clinic attends to 85–105 patients being reviewed in clinic days that are scheduled every week with blood pressure control being inadequate in the country (Wamala JF, 2009). According to Ministry of Health in Kenya 2015 NCD caused 28% deaths with more 50% admissions in hospitals attributed to cardiovascular diseases that were related to hypertension complications. A study conducted on households in Kenya urban settlement, revealed that NCDs cause a 24% decrease in household income. The study reported that cost of hypertension drugs ranged from \$25 to \$250 and \$420 to \$ 990 monthly in both public and private health facilities respectively and hence majority of the patients could not afford the drugs (Subramanian S, 2018). The National Hospital Insurance Fund of Kenya is the largest national health insurance institution. It is open to every Kenyan adult and their dependents. The medical benefits entitled to insured persons include all health services from diagnosis to treatment for all NCDs. The government of Kenya is putting efforts to increase its coverage to all Kenyans since about 22 % of Kenyans had national insurance cover, NHIF in 2014 (Okech, 2016). It is noted that needy households living in rural areas were most likely not to be insured therefore affecting their access to NCDs medicines (Subramanian, 2018). Lack of health insurance contribute to NCDs medicines not accessible and costly in LMICs, where the prevalence of NCDs is on the rise (Wirtz, 2017).

1.1 Statement of the Problem

Studies conducted in the past focus on hypertension prevalence in various parts of Kenya and the adherence to the hypertensive medication. There is little done on the accessibility to the hypertensive medications. The accessibility to this medications can be viewed as a contributing factor of non-adherence or adherence to the medication or increase or decrease of prevalence rates. In Kenya patients die, are disabled or seriously ill due to hypertension related complications. This could be associated with medication accessibility leading to the uncontrolled hypertension. In the overall uncontrolled hypertension could negatively affect wellbeing and jeopardize the attainment of health targets set by the WHO and in Kenya the government big 4 agenda.

1.2 Research Objectives

1. To determine how gender influences accessibility of hypertensive drugs.
2. To establish the influence of cost of drugs on accessibility of hypertensive drugs.
3. To investigate the influence of patients' education level on the accessibility of hypertensive drugs.
4. To assess the influence of different prescription patterns on accessibility of hypertensive drugs.

2.0 Literature Review

2.1 Empirical Review

2.1.1 Magnitude of the Problem of Hypertension

Hypertension is among the most serious public health problem and a global burden. In 2015, 1.14 billion adults had raised blood pressure globally. It is further noted that in the same year, over 21% of all deaths were associated with elevated SBP (>115 mm Hg) (Forouzanfar MH, 2017). Lancet affirms that “the global burden of hypertension has been growing over time, highly driven by population growth, changes in lifestyle, and aging.” An approximated 75% of people with hypertension live in low- and middle-income countries. The rate of deaths from high SBP have increased by an average rate of 1.6 % yearly between 1990 and 2015 (Mills KT, 2016). It is estimated nearly 17.5% of patients with hypertension globally live in India, which suggested an expected increase in cardiovascular diseases burden in the near future (Roy, 2017). According to CDC, 108 million Americans have hypertension but only 27 million are considered to have their blood pressure under control, despite it being a condition that can be managed. Notable is the increasing concern on hypertension control since less than a fifth of patients worldwide have managed to control the disease (Egan, 2019). Globally, high disparities in blood pressure control, treatment and awareness, with hurdles that are very acute in middle- and low-income countries. Based on 2010 data a comparison done between high income countries and low- and middle-income countries indicated there was a doubled level of awareness to 69.0% versus 38 % and treatment 56 % versus 30.0% and 4 times the control of hypertension 29 % versus 8 % respectively (Mills KT, 2016).

Access to hypertension treatment can be a challenge globally due problems associated with availability, acceptability, and affordability of medications to the patients (WHO, 2017). A number of patients with HTN do not take anti-hypertensive medication at all and the ones who take the drugs do not adhere to prescription. Factors associated with low adherence include unaffordable treatment costs, patients’ perception and beliefs about CVs, (Wirtz V.J, 2016). Stock-outs of medicines as well as problems associated with the quality of medicines dispensed to patients, leads to patients having to purchase for the medicines which is often high hence contributing to not taking medication or non-adherence (Vialle-Valentin CE, 2015). Hypertension prevalence in Africa is identified as being the highest by the WHO, as compared to 35% in the Americas and other high-income countries, about 46 .5 % of adults are hypertensive (WHO, 2015). Complications associated with hypertension like stroke and heart failure are linked to personal and societal lifestyles like excessive alcohol consumption, high usage of tobacco, adopting diets high in unhealthy fats and oils, refined sugar and salt and minimal or lack of physical activity hence causing increase in hypertension cases, (Williams, 2004). Effective hypertension management includes; awareness, treatment and control. Africa is noted to be lagging behind as compared to other regions in the world where a good number of people with hypertension are not aware of their condition and for the ones diagnosed with hypertension, treatment is not adequate (Gaziano TA, 2008). The United Nations states that diagnose, prevent, and treat hypertension in Africa should be considered a health priority (van de Vijver, 2014).

LIC face a challenge in administering healthcare and not receiving enough disease-specific external financing hence having health systems that are underfunded overall (Mills KT, 2016). Uganda is an example where up to 76% of healthcare is accounted for by private expensing (WHO, 2015). It is noted that “of the EA deaths, 45% are attributable currently to NCDs, with the diseases

anticipated to get higher than communicable diseases (CDs) as the leading causes of death in sub-Saharan Africa (SSA) over the next 20 years” (Siddharthan, 2015). The United Nations Development Programme states that “NCDs are not just some of the world’s most pressing health concerns but also significant development challenge since they impede socio economic development” (UNDP, 2013). Social determinants of health (SDH) like poverty, urbanization, and environmental degradation are noted to be present in LICs hence becoming another contributing factor to NCDs (WHO, 2012).

Urbanization is another determinant noted to be under way throughout EA, resulting to a high increment in CVDs among urban population. (Musunguzi G, 2018) notes that traditional and cultural beliefs are a determining factor among some hypertension patients while seeking medical attention. Services for hypertension, diabetes, epilepsy, depression, and schizophrenia are frequently sought from traditional or faith healers due to greater accessibility and lower cost. The services sought usually have unrealistic promises of a cure (Siddharthan, 2015). NCDs in Kenya has increased to 43% in 2010 from 37% in 2003, with hypertension as a major contributor to the trend (Mohamed, 2018). A study carried out in Mombasa by (Jenson A, 2011) Kenya report that the prevalence rate of hypertension from different populations range and settings from 20 to 33 %. (KDHS) 2014 indicate that 3% of men and 10% of women aged 15–49 years stated that a health care provider had given them information that they were hypertensive (KNBS, 2014). In addition, urbanization is noted to among the major factors that contribute to NCD increase in developing countries (Patricia M, 2005). According to (Mathenge, Foster, & Kuper, 2010), 56% of Kenyans have never measured their blood pressure.

2.2 Theoretical Framework

2.2.1 The Concept of Essential Medicines

Good health is key in ensuring productivity and therefore access to medicines is key to the wellbeing of humans that should be exercised equally (WHO, 2005). Medicines are viewed as a tool for prevention, curing and rehabilitating in health care and therefore to make sure that every person is receiving the medicine needed, the ‘essential medicines’ concept was introduced by WHO in 1975. A model of the essential medicines list (EML) in 1977 followed which was said to be a first model of essential medicines. There was also an addition of essential medicines as part of the 8 components of primary health care in 1978 (Quick, 2002). Essential medicines is defined by WHO as “medicines that satisfying the healthcare needs of a majority population and therefore should be made available at all times in the required amount” (WHO, 2008). Essential medicines are made available in a health system at all times with the required amounts, right dosage forms, standard quality and at a cost the individual can easily pay from his or her pocket. WHO also describes, access as an aspect that ensures healthcare services are available wherever the patient needs them (WHO, 2007).

2.2.2 The Tannahill Intervention Based Model of 1980

The health promotion model by Andrew Tannahill has 3 overlapping spheres of activities; prevention, health protection and health education. Andrew argued that Health education is designed to facilitate health by changing the knowledge, beliefs, attitudes, and behavior of people. Disease prevention focus in reducing the effects of the disease and decreasing risk factors while Health protection handle legal or fiscal policies and controls aimed to prevent ill health and enhance well-being (Tannahill A. , 1985). Tannahill, 2009 states that “health protection includes public policies that address fair access to housing, employment, education, and health care”

(Tannahill A. , 2009). Even though the Tannahill model has received criticism for being clearly within the reductionist, medical model in that it does not pay sufficient to community-based factors. Tannahill responded to the critiques, where he proposed a new definition of health promotion as the “sustainable fostering of positive health and prevention of ill-health through policies, strategies, and activities in the overlapping action areas of: social, economic, physical, environmental, and cultural factors”. He also added that amenities, learning services, education, diversity, equity, community-led and based activity are also activities within overlapping action areas. His new definition was based on community-based participatory research evaluation.

2.3 Conceptual Framework

Independent variables dependent variable

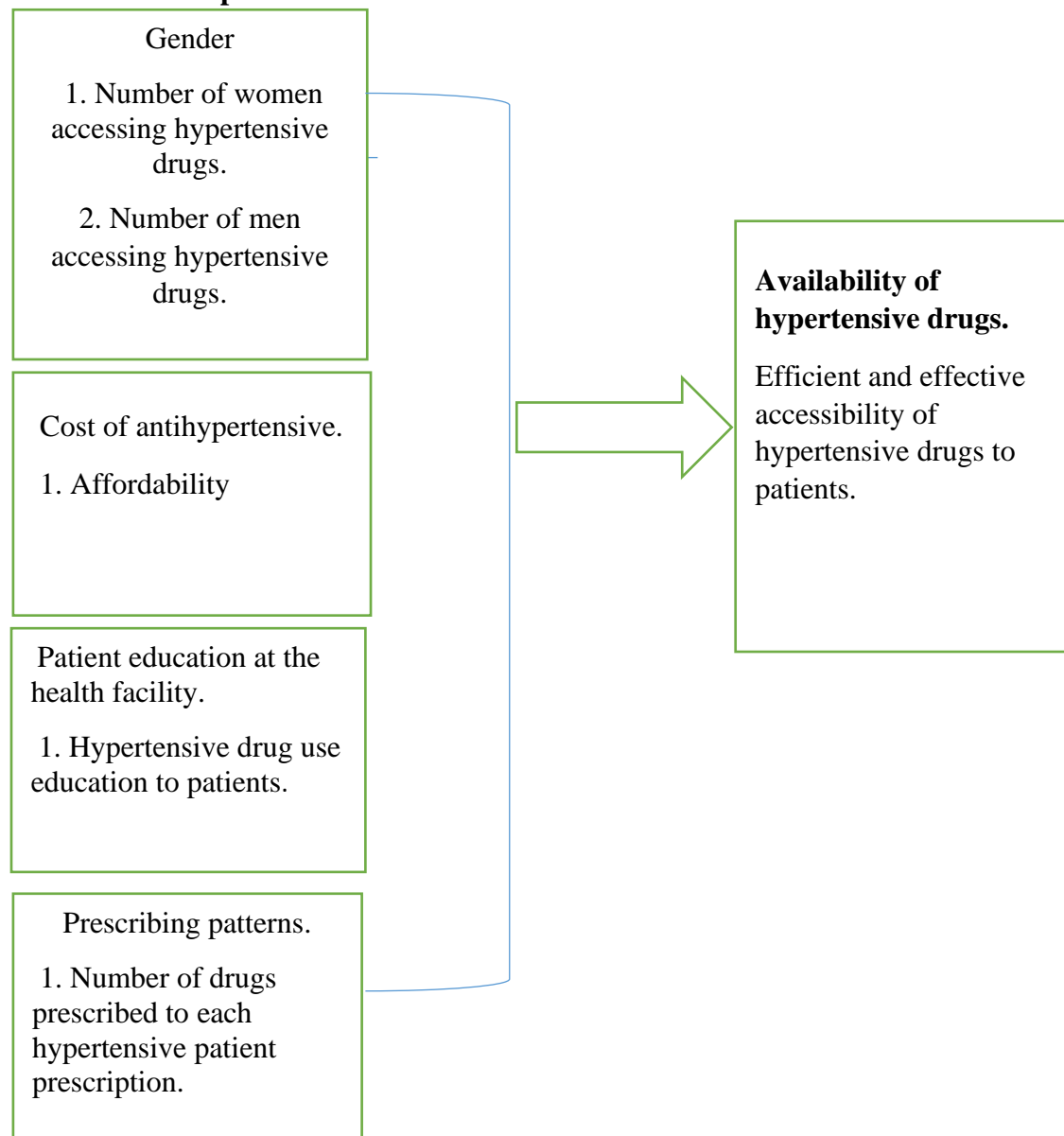


Figure 1: Conceptual Framework

3.0 Research Methodology

Descriptive research design was employed. (Orodho, 2003) accords that the design is a scheme outlined plan that will generate answers to the research problem. Descriptive survey design involves collecting data using a questionnaire. The study was done in a third of the 81 public health facilities within Nairobi County. This research was done in a twenty seven out of eighty-one public health facilities within Nairobi County. The health facilities of study were offering hypertension clinics to the patients. 6239 hypertensive patients who are captured in the Nairobi County iHRIS formed the study target population. However a sample size of 292 patients was utilized. Patients who are 18 year and above qualified to take part in the exercise. Systemic random sampling method was deployed in recruiting the sample size. The respondents were informed on the need of this research. The data was gathered as the patient were dispensed with the medicines, after their eligibility was assessed and an informed consent obtained. The file number of every patient was input in the instrument so as to avoid multiple enrollments. Yamane's formula was used in calculating the sample size of hypertensive patients for the study. The study adopted the Yamane formula to identify the sample size from the target population (Yamane, 1967). The research used a questionnaire to collect the information from the patients. The questionnaire contained a set of structured questions for guiding the researcher. Research assistants were involved in data collection. They were trained on the study objectives and data collection instrument that was used. The qualitative data was organized into themes based on the research objectives whereas quantitative data was analyzed by use of statistical SPSS. Inferences between the variables for presentation were drawn using percentages and frequency distribution tables.

4.0 Data Analysis Results

Affordability was determined by the respondents' average monthly income, expenses in a month, and monthly spending on hypertensive drugs. Table 4.8 displays the summary of the correlation analysis (Pearson's Correlation) conducted. With $P < 0.01$ ($P = 0.002$) and at 99% confidence level, the mean values of cost have a significant difference. This means that the null hypothesis, the cost (affordability) influences the accessibility of hypertensive drugs, holds. From the table we see that the Pearson Correlation co-efficient is -0.245; this means that cost and accessibility of hypertensive drugs are negatively correlated. An increase in cost reduces the accessibility to hypertensive drugs and vice versa.

Table 1 Summary of Correlation between Cost (Affordability) and Accessibility of Hypertensive Drugs

		Cost of Drugs	Accessibility of Hypertensive Drugs
Cost of Drugs	Pearson Correlation	1	-245**
	Sig. (2-tailed)		.002
	N	292	292
Accessibility of Hypertensive Drugs	Pearson Correlation	-245**	1
	Sig. (2-tailed)	.002	
	N	292	292

**Correlation is significant at the 0.01 level (2-tailed)

This analysis sought to establish whether patient's health education influenced accessibility of hypertensive drugs. Patient education was determined by the respondents' current education level, whether they did you get hypertension health education from the health facility they collected their medicine, and the frequency of receiving health education in three months. The summary of the correlation analysis (Pearson's Correlation) conducted is presented in Table 1.

With $P < 0.05$ ($P = 0.027$) and at 95% confidence level, the mean values of health education have a significant difference. This means that the null hypothesis, the health education influences the accessibility of hypertensive drugs, holds. From the table we see that the Pearson Correlation coefficient is 0.178; this means that health education and accessibility of hypertensive drugs are positively correlated. An increase in health education on hypertension increases the accessibility to hypertensive drugs and vice versa.

Table 2 Summary of Correlation between Health Education and Accessibility of Hypertensive Drugs

		Accessibility of Hypertensive Drugs	Health Education on Hypertension
Accessibility of Hypertensive Drugs	Pearson Correlation	1	.178**
	Sig. (2-tailed)		.027
	N	292	292
Health Education on Hypertension	Pearson Correlation	.178**	1
	Sig. (2-tailed)	.027	
	N	292	292
**Correlation is significant at the 0.05 level (2-tailed)			

This analysis sought to establish whether prescription pattern influenced accessibility of hypertensive drugs. Prescription pattern was determined by the respondents' number of different hypertensive drugs on their monthly prescription, ability to buy all the prescribed drugs at once, and the reasons for not being in a position to buy all the prescribed drugs at once. The summary of the correlation analysis (Pearson's Correlation) conducted is presented in Table 2.

With $P > 0.05$ ($P = 0.279$) and at 95% confidence level, the mean values of prescription pattern do not have a significant difference. This means that the null hypothesis, the prescription pattern influences the accessibility of hypertensive drugs, is rejected. As a result, the alternate hypothesis holds; that is, prescription pattern does not in any way influences the accessibility of hypertensive drugs.

Table 3 Summary of Correlation between Prescription Pattern and Accessibility of Hypertensive Drugs

		Accessibility of Hypertensive Drugs	Prescription Patterns of Hypertensive Drugs
Accessibility of Hypertensive Drugs	Pearson Correlation	1	.088**
	Sig. (2-tailed)		.279
	N	292	292
Prescription Patterns of Hypertensive Drugs	Pearson Correlation	.088**	1
	Sig. (2-tailed)	.279	
	N	292	292

5.0 Conclusions and Recommendations

5.1 Conclusions

There was a high prevalence of good drug adherence to antihypertensive medications. Determinants of accessibility of hypertensive drugs by adult patients on sustainable development goal, factors like gender groups, and cost of drugs, patient education and different prescribing patterns are important predictors of accessibility of antihypertensive medications. Drugs affordable prices and good client-provider interaction highly influence drug accessibility which contributes to hypertensive drugs adherence by the patients. There has been a link between use of community health workers (CHW) in providing care for chronic diseases and cost-effectiveness and increased adherence in health facilities offering hypertensive clinics in Nairobi City County.

5.2 Recommendations


Cost and availability of hypertensive drugs is something that should further be researched putting in consideration the hypertension programmes that are available in health centres. Research on the contribution of hypertensive programmes in low-resource settings where uptake of healthcare tasks by non-healthcare providers are used to ensure that hypertensive patients are accessing drugs and adhering to the medications will be informative. Further investigation on finding out how cost effectiveness is influenced by the use of CHW in providing chronic disease care is necessary. Detailed cost-based research should be conducted on the various hypertensive drugs present in a patient prescription, putting in consideration the essential drugs model and their affordability by both patients and programmes supporting availability of the medications to promote sustainability of the programmes.

References

- Angeli, F. R. (2013). Hypertension around the world: new insights from developing countries. *Journal of hypertension*, 31(7), 1358-1361.
- Ataklte F, E. S.-T. (2014). *Burden of undiagnosed hypertension in sub-Saharan Africa. A systematic review and meta-analysis. Hypertension.*
- Bibbins-Domingo K, C. G. (2010). *Projected effect of dietary salt reductions on future cardiovascular disease.* N Engl J Med.
- Bloom, D. E.-L.-G. (2012). *The global economic burden of noncommunicable diseases (No. 8712). Program on the Global Demography of Aging.*
- Burns, N. &. (n.d.). Using statistics to examine relationships. Burns N, Grove SK, eds *The Practice of nursing research: Conduct, Critique and Utilization* 5th ed St Louis, MO. In 2005. Elsevier.
- Chow CK, T. K. (2013). In *The PURE (Prospective Urban Rural Epidemiology) Study investigators. Prevalence, awareness, treatment, and control of hypertension in rural and urban communities in high-, middle-, and low-income countries* (pp. 310; 959-968). JAMA.
- Constant AF, G. E. (2016). *Hypertension and Cardiovascular Disease.*
- Dewhurst, M. J., F. D., W. K., P. C., G. P., & Walker, &. R. (2013). *Journal of Human Hypertension* volume 27. pages 374–380.
- Egan, B. M. (2019). The global burden of hypertension exceeds 1.4 billion people: should a systolic blood pressure target below 130 become the universal standard? *Journal of hypertension*, 37(6), 1148-1153.
- Forouzanfar MH, L. P. (2017). *Global burden of hypertension and systolic blood pressure of at least 110 to 115 mm Hg, 1990-2015.* JAMA.
- Gaziano TA, Y. C. (2008). *Laboratory-based versus non-laboratory-based method for assessment of cardiovascular disease risk: the NHANES I Follow-up Study cohort. The Lancet.*
- Geldsetzer, P. e. (2019). The state of hypertension care in 44 low-income and middle-income countries: a cross-sectional study of nationally representative individual level data from 1·1 million adults. *The Lancet.*
- Hendriks M.E, W. F. (2012). *Hypertension in sub Saharan Africa cross sectional surveys in four rural and urban communities.*
- Hosseinpoor A.R, B. N. (2012). *Socioeconomic inequalities in risk factors for non-communicable diseases in low-income and middle-income countries: results from the World Health Survey, BMC Public Health, 12.*
- HV, H. (2006). *Essential medicines and human rights: what can they learn from each other? Bull World Health Organ.*
- Jenson A, O. A. (2011). *Assessment of hypertension in Mombasa, Kenya.*
- Kaufmann, E. K. (2012). Thompson sampling: An asymptotically optimal finite-time analysis. In *International conference on algorithmic learning theory.* Springer, Berlin, Heidelberg.
- Kazungu J.S and Barasa E.W. (2017). *Examining levels, distribution and correlates of health insurance coverage in Kenya.*
- KNBS. (2009). *Kenya Population and Housing Census.*
- KNBS. (2014). *Kenya Demographic and Health Survey.*
- Kostova, D. S. (2020). *The cost-effectiveness of hypertension management in low-income and middle-income countries: a review. BMJ global health.*
- Lawes CM, R. A. (2013). *Blood pressure and cardiovascular disease in the Asia Pacific region.*
-

- Magnusson, R. S. (2014). The role of law and governance reform in the global response to non-communicable diseases. *Globalization and health*.
- Mathenge, W., Foster, A., & Kuper, H. (2010). *Urbanization, ethnicity and cardiovascular risk in a population in transition in Nakuru, Kenya: a population-based survey*. *BMC Public Health*, 10. p. 569. ISSN 1471-2458.
- Mensah G.A. (2008). *Ischaemic heart disease in Africa Heart*.
- Mills KT, B. J. (2016). *Global disparities of hypertension prevalence and control: a systematic analysis of population-based studies from 90 countries*.
- MOH. (2015). *Access to Antihypertensive Medicines at the Household Level: A Study From 8 Counties of Kenya: Government of Kenya*.
- Mohamed, S. F. (2018). *Prevalence, awareness, treatment and control of hypertension and their determinants: results from a national survey in Kenya*. *BMC public health*.
- Mueke, A. T. (2013). *Factors influencing adherence to hypertension medication: A case study of hypertension patients at (Mama Lucy Kibaki Referral Hospital Embakasi Nairobi) (Doctoral dissertation, University of Nairobi)*.
- Mugenda, O. &. (2003). *Research methods: quantitative and qualitative approaches*.
- Mugenda, O. (2003). *Research Methods, Quantitative and Qualitative Approaches*. ACT. Nairobi.
- Musinguzi G. (2018). *Nonpharmacologic Interventions in Prevention and Treatment of Hypertension*.
- Musinguzi G, N. F. (2013). *Prevalence, awareness and control of hypertension in Uganda*.
- Okech, T. C. (2016). Analysis of universal health coverage and equity on health care in Kenya. *Global journal of health science*, 8(7), 218.
- Opie LH, S. Y. (2005). *Hypertension in sub-Saharan African populations*.
- Orodho, A. (2003). *Essentials of Educational and Social Science Research Methods*. . Nairobi: Mazola Publishers.
- Patricia M, K. M. (2005). *Global burden of hypertension: analysis of worldwide data*.
- Peck R, M. J. (2014). *Preparedness of Tanzanian health facilities for outpatient primary care of hypertension and diabetes: a cross-sectional survey*. *Lancet Glob Health* 2: e285–e292.
- Quick, J. D. (2002). Twenty-five years of essential medicines. *Bulletin of the World Health Organization*.
- Roy, A. P. (2017). *Changes in hypertension prevalence, awareness, treatment and control rates over 20 years in National Capital Region of India: results from a repeat cross-sectional study*. *BMJ open*.
- Sandberg, K. &. (2012). Sex differences in primary hypertension. *Biology of sex differences*.
- Siddharthan, T. R. (2015). Noncommunicable diseases in East Africa: assessing the gaps in care and identifying opportunities for improvement. *Health Affairs*.
- Subramanian S, G. R. (2018).
- Subramanian, S. G. (2018). Cost and affordability of non-communicable disease screening, diagnosis and treatment in Kenya: Patient payments in the private and public sectors. . *PloS one*, 13(1), e0190113.
- Tannahill, A. (1985). What is health promotion?. *Health education journal*. 44(4), 167-168.
- Tannahill, A. (2009). Health promotion: theannahill model revisited. *Public health*. 123(5), 396-399.
- Thorogood M, C. M. (2007). Understanding and managing hypertension in an African sub-district: a multidisciplinary approach. *Scand J Public Health Supply*.
- UNAIDS. (2014). *The GAP report. Joint United Nations Programme on HIV/AIDS*. Geneva.

- UNDP. (2013). *Human Development Report; The Rise of the South: Human Progress in a Diverse World*.
- van de Vijver, S. A. (2014). *Status report on hypertension in Africa-Consultative review for the 6th Session of the African Union Conference of Ministers of Health on NCD's*.
- Vialle-Valentin CE, S. B.-D. (2015). *Evidence on access to medicines for chronic diseases from household surveys in five low- and middle-income countries. Health Policy Plan*.
- Wagirumukiza M, D. B. (2011). *Current and projected prevalence of arterial hypertension in sub-Saharan Africa by sex, age and habitat: an estimate from population studies*. J Hypertens.
- Wamala JF, K. Z. (2009). *Prevalence factors associated with hypertension in Rukungiri district, Uganda—a community-based study*.
- WHO. (2005). *Public Health Agency of Canada, & Canada. Public Health Agency of Canada. Preventing chronic diseases: a vital investment*.
- WHO. (2007). *The selection and use of essential medicines. Report of the WHO Expert Committee*.
- WHO. (2008). *Medium-term strategic plan 2008-2013 and proposed programme budget 2008-2009. World Health Organization*.
- WHO. (2009). *Global health risks; mortality and burden of disease attributable to selected major risks*. Geneva: World Health Organization; 2009.
- WHO. (2010). *Healthy Workplace Framework and Model*.
- WHO. (2012). *Intersectoral actions for addressing social determinants of health: Report of a regional consultation, WHO-SEARO, New Delhi*.
- WHO. (2014). *Global status report on noncommunicable diseases (No. WHO/NMH/NVI/15.1). World Health Organization*.
- WHO. (2014). *Global status report on non-communicable diseases 2014*. Geneva: World Health Organization, 2015.
- WHO. (2015). *Hypertension Study*. Nairobi: Adventure.
- WHO. (2017). *Non communicable diseases progress monitoring. Are we meeting the time-bound United Nations targets?* Copenhagen.
- Whyte SR. (2014). *Timeliness and Chronic Medication: Knowledge about Hypertension and Diabetes in Uganda*.
- Williams, B. P. (2004). *British Hypertension Society guidelines for hypertension management*.
- Wirtz V.J, K. W. (2016). *Access to medications for cardiovascular diseases in low- and middle-income countries*.
- Wirtz, V. J. (2017). *Essential medicines for universal health coverage. The Lancet*.
- Yamane, T. (1967). *Statistics, An Introductory Analysis, 2nd Ed., New York: Harper and Row*.

This is an open-access article published and distributed under the terms and conditions of the  [Creative Commons Attribution 4.0 International License](https://creativecommons.org/licenses/by-nc/4.0/) of United States unless otherwise stated. Access, citation and distribution of this article is allowed with full recognition of the authors and the source. Authors seeking to publish with an Internationally Peer Reviewed Journals should consider <https://www.ijcab.org/> by writing to the Editor at editor@ijcab.org or submitting online at <https://journals.ijcab.org/journals/index.php>. The articles must be quality and meet originality test.