Ф А 2.2.1-32-367

MINISTRY OF HEALTH OF UKRAINE
NATIONAL UNIVERSITY OF PHARMACY
faculty for foreign citizens' education
department of social pharmacy

QUALIFICATION WORK

on the topic: «**STUDY ON THE INFLUENCE OF SOCIOECONOMIC FACTORS ON HYPERTENSION PREVALENCE»**

Performed by: higher education graduate of group Фм20*(4,10д)англ-02
specialty 226 Pharmacy, industrial pharmacy
educational program Pharmacy
Thelma Godfrey AKPAMA
Supervisor: associates professor of higher education institution of department of social pharmacy, PhD, Iryna SURIKOVA
Reviewer: associate professor of higher education institution of department of pharmaceutical management and marketing department
Iryna BONDARIEVA

Kharkiv – 2024

ANNOTATION

The influence of socioeconomic factors on hypertension prevalence was investigated in the qualification work. The study analyzed the prevalence of hypertension and approaches to the hypertension treatment, as well as the economic affordability of hypertension drugs and factors influencing the socioeconomic availability of hypertensive drugs in Nigeria.

The qualification work consists of an introduction, 3 chapters, conclusions, a list of used sources and is laid out on 45 pages of printed text. The work is illustrated with 5 figures and 3 tables. The bibliography includes 32 information sources.

Keywords: hypertension, WHO strategy, socio-economic determinants, antihypertensive drugs, drugs affordability

АНОТАЦІЯ

У кваліфікаційній роботі досліджено вплив соціально-економічних факторів на поширеність гіпертонічної хвороби. Проаналізувано поширеність гіпертонії та підходи до лікування гіпертонії, а також економічну доступність антигіпертензивних ЛЗ та фактори, що впливають на соціально-економічну доступність антигіпертензивних ліків в Нігерії.

Кваліфікаційна робота складається зі вступу, 3 розділів, висновків, списку використаних джерел та викладена на 45 сторінках друкованого тексту. Робота ілюстрована 5 рисунками та 3 таблицями. Бібліографія включає 32 інформаційних джерел.

Ключові слова: гіпертонія, стратегія ВООЗ, соціально-економічні детермінанти, антигіпертензивні препарати, доступність ліків

CONTENT

LIST OF ABBREVIATIONS

ACC – American College of Cardiology

ACE – Angiotensin-Converting Enzyme

AHA - American Heart Association

API – Active Pharmaceutical Ingredients

ARBs – Angiotensin II Receptor Blockers

BHPF – Basic Healthcare Provision Fund

CCB – Blockers of Calcium Channels

CDC – Centers for Disease Control and Prevention

DBP – Diastolic Blood Pressure

ESC – European Society of Cardiology

HTN – Hypertension Treatment in Nigeria

ISH – International Society of Hypertension

mmHg – Millimeters of Mercury

NBS – National Bureau of Statistics

NCD – Non-Communicable Diseases

NGN – Nigerian Naira

NGO – Non-Governmental Organizations

NHIS – National Health Insurance Scheme

NHS – Nigerian Hypertension Society

PHC – Primary Healthcare Centers

SBP – Systolic Blood Pressure

WHO – World Health Organization

INTRODUCTION

hypertension remains one of the leading risk factors for cardiovascular diseases globally. Understanding how socioeconomic variables—such as income, education, employment status, and access to healthcare—affect hypertension rates can provide valuable insights into public health strategies and interventions. In many regions, individuals from lower socioeconomic backgrounds experience higher rates of hypertension, which can be attributed to limited access to healthcare services, unhealthy lifestyle choices, and increased stressors associated with economic instability. By investigating these relationships, the study can contribute to a deeper understanding of the social determinants of health and their role in shaping health outcomes. Thats why the study of socioeconomic factors and their influence on hypertension prevalence is highly relevant in today's context.

Finally, this study's relevance extends beyond hypertension itself, as it underscores the interconnectedness of health, socioeconomic status, and overall quality of life. By exploring how socioeconomic factors influence hypertension prevalence, the research can contribute to broader discussions about health equity and social justice. It can shed light on the systemic issues that perpetuate health disparities and advocate for comprehensive policy changes that address the root causes of these inequalities. Ultimately, this research also has the potential to highlight the importance of integrating social determinants into healthcare planning and resource allocation, ensuring that interventions are equitable and effective.

Overall, study of socioeconomic factors and their influence on hypertension prevalence is highly relevant in today's context.

The purpose of the study: was to analyze current state of the influence of socioeconomic factors on hypertension prevalence. This includes studying the prevalence of the disease, the treatment policies of disease and also economic availability and social factors which affect for hypertension in Nigeria.

Research objectives:

- to conduct a review of literary sources on social burden of hypertension issues;
- to study of hypertension as a public health problem and social burden of tuberculosis;
- to analyze the prevalence of hypertension in the world and Nigeria;
- to study of drug therapy treatment of hypertension in accordance with international guidelines
- to analyse WHO essential medicine list and Nigerians essential medicine list Essential Medicines for Hypertension;
- to compare of Nigerian hypertension guidelines with Global Standard
- to research on affordability of hypertension drugs in Nigeria;
- to analyze of factors influencing the economic availability of hypertensive drugs in Nigeria.

The object of the research became literary sources on the development of hypertension treatment and prevention, the regulatory and legal framework, research by international public organizations, statistical data, WHO Model list of essential medicines, Essential medicines list in Nigeria, National health insurance scheme medicines price list (Nigeria).

The subject of the study is the identification and assessment of modern socioeconomic factor which influence for hypertension prevalence and treatment.

Research methods. System, analytical and comparative, graphic and logical methods, method of descriptive and abstract modelling and generalization were used.

The scientific novelty and practical significance of the obtained results lies in its comprehensive examination of the interplay between socioeconomic factors and hypertension prevalence, focusing on underexplored dimensions and relationships that have not been extensively documented in existing literature. The practical significance of this research is profound, as it has the potential to inform public health policy, healthcare practices, and community interventions aimed at

reducing hypertension prevalence, particularly among at-risk populations in Nigeria. The findings can guide policymakers in identifying high-risk groups and allocating resources more effectively to address the social determinants of health that contribute to hypertension.

Structure and scope of qualification work. The qualification work consists of the introduction, three chapters, conclusions to each chapter, a general conclusion, and list of used sources. The results of the study are presented on 45 pages of text, the number of figures – 5, table – 3, and the list of references – 32 titles.

Chapter 1
LITERATURE REVIEW ON THE ISSUE OF HYPERTENSION

1.1 The concept of hypertension as a public health issue

Hypertension, commonly known as high blood pressure, can be defined as a severe medical condition where the force of blood against the arteries walls is persistently too high. When blood is pumped through the arteries to all parts of the body, the force at which it is pushed determines whether blood pressure will be low or high. This means that when blood pressure is high, the heart has to pump harder [1].

Blood pressure is important in the body because it ensures that blood is flowing to all the bodies organs. This is also how the body transports oxygen and exchanges nutrients and gases to and from the capillaries. It is measured in millimeters of mercury (mmHg). Blood pressure is record-ed using two numbers:

1. **Systolic pressure:** This is the top number on the blood pressure reading. It plays a greaterrole than diastolic pressure because it measures blood pressure during heartbeats.
2. **Diastolic pressure:** This is the lower number on the blood pressure reading. It measuresblood pressure when the heart is at rest between beats.

For example, in a case where a persons blood pressure is 150/90mmHg, 140 is systolic and 90 isdiastolic.

The table 1.1 below shows systolic and diastolic rates at which normal, elevated and highblood pressure can be defined [2].

Table 1.1

Blood pressure categories according to systolic and diastolic rates

Blood Pressure Categories			
CATEGORY	**SYSTOLIC mm Hg**		**DIASTOLIC mm Hg**
NORMAL	LESS THAN 120	And	LESS THAN 80
ELEVATED	120 – 129	And	LESS THAN 80
HIGH BLOOD PRESSURE STAGE 1	130 – 139	And	80 – 89
HIGH BLOOD PRESSURE STAGE 2	140 OR HIGHER	And	90 OR HIGHER
HYPERTENSIVE CRISIS	HIGHER THAN 180	And	HIGHER THAN 120

This table 1.1 also shows the different stages of hypertension. Hypertensive crisis being the last and most critical state requires calling a doctor or getting medical attention immediately as it could have very serious effects and even result in death.

Hypertension can be categorized into two main types:

Primary or Essential Hypertension:

The physiological cause of essential hypertension is still a mystery even though it affects 85 – 95% of people with high blood pressure. Even after many years of research, scientists are yet to find a specific cause. It is thought to be associated with risk factors such as poor diet, genetics, age, lifestyle choices like lack of physical activity or exercise, smoking, excessive consumption of alcohol, etc.

Secondary Hypertension:

This is a rare type of hypertension. It occurs only in about 5 – 10% of people. This type of hypertension can be identified because it is caused by other underlying diseases the patient may have. This could be hormonal, nephrotic or even caused by other medications that the patient may have taken. It is said that secondary hypertension mostly affects younger people. About 30% of people

below the age of 40 who have hypertension are said to have secondary hypertension. Some causes of secondary hypertension include:

- Thyroid gland disease
- Adrenal gland disease
- When the arteries become narrow
- As a side effect of birth control, anti depressants, stimulants, etc [3].

It can also be classified by subtypes. These subtypes are usually more complicated in- stances, that can fall into the category of primary and secondary but are further classified into: malignant and resistant

Malignant hypertension is a medical emergency characterized by an extremely high blood pressure level that damages a person's organs. It occurs diastolic readings above 120 mmHg and systolic pressure higher than 120 to 130 mm Hg. It is the most severe type of hypertension and a form of hypertensive emergency. This is also very rare.

Resistant hypertension occurs when blood pressure remains above target levels despite the use of three or more antihypertensive medications. It either does not respond to treatment or re- quires multiple medications taken simultaneously to control it. It is a more difficult form of hypertension to control and so it requires more intensive medical attention and management.

Isolated systolic hypertension occurs when only the systolic blood pressure is elevated. This is when the patients systolic blood pressure rises above 140 mmHg and their diastolic blood pressure drops below 90 mmHg. It is the most frequent type of hypertension in older patients. Al-though it can occur in younger patients, it is less common. Researchers believe it occurs due to stiffening of the artery walls as a result of aging [4].

The pathophysiology of hypertension involves the complicated interaction of multiple physiological systems in the body. This includes the nervous system, kidneys, adrenal glands, etc. Any abnormalities in these systems results in higher blood volume, increased cardiac output, nar-rowing of blood vessels, etc. and contributes to high blood pressure.

If left untreated, high blood pressure can cause atherosclerosis, damage to organs like the,kidneys, the heart, and in severe cases, life threatening problems like stroke.

Hypertension development is influenced by a wide range of risk factors, some of whichinclude:

1. **Genetics and Family History**: Genetics are very important in hypertension. Most of the information we have currently about high blood pressure came from genetics research. There are many genes that have been said to increase the risk of high blood pressure. Hyper- tension often runs in the family.

2. **Age**: Hypertension is typically higher in older people. This is due to thickening of blood vessels with age. Different lifestyle factors also cause the vessels to become stiff. Hypertension is not only limited to old people, secondary hypertension although less common is said to be more prevalent in younger people.

3. **Gender / Sex**: Women tend to have high blood pressure after menopause, due to anincrease in the level of oestrogen in the body and hormonal changes that can affect cardio- vascular health. On the other hand, men are more likely to develop hypertension before theage of fifty five.

4. **Race / Ethnicity:** Studies show that Africans are more likely to have high blood pres-sure than any other race. It mostly manifests earlier in life and is accompanied with other more severe health issues.

5. **Medical Conditions**: Obesity, diabetes, tumors, kidney diseases, hyperlipidemia and other medical conditions can complicate the way the body controls fluids, sodium, hormones and how the body manages blood pressure, thereby causing it to rise. [5]

1.2 The economic and social burden of hypertension.

Although there is a range of medicinal products available for hypertensive patients, many of them face a number of difficulties while trying to manage their condition. Some examples include:

1. Medication adherence is a major problem among hypertensive patients. Most patients struggle to keep up with the need to take medications daily. This could be due to a number of reasons like the terrible side effects of these medications, forgetfulness, etc. Education is important in cases like these because patients need to see the importance of consistency when taking these medications. Simpler dosage forms should also be considered if possible.

2. Cognitive Decline due to damage of delicate blood vessels in the brain over time. There is a reduction in oxygenation and blood flow to the brain causing cognitive impairments like impaired memory, slower mental comprehension, lack of focus, forgetfulness, etc.

3. Implementing new lifestyle changes tends to be harder on some people. Incorporating healthier meals and exercising to one's every day life might be challenging especially if resources are limited. Quitting smoking and drinking alcohol, cutting back on salty foods and maintaining a balanced diet are all very important.

4. Patients also experience visual disorders like blurry vision, retinopathy, emotional dis- tress, sexual dysfunction, distorted sleep and susceptibility to other diseases because the blood vessels get damaged over time [6].

Access to primary healthcare services is the key to prevention, diagnosis, and management of hypertension. Effective primary healthcare systems that focus on preventive care, early detection, and regular follow-up can significantly reduce the stress of hypertension related com-plications [7].

For instance, many Nigerians have limited access to primary care around the areas where they live. This is especially true for people in economically disadvantaged neighborhoods. People living in areas with fewer primary health

care professionals had a higher chance of having hyper- tension when compared to people living in neighborhoods with a higher number primary care physician.

Healthcare systems face numerous challenges when it comes to addressing hypertension. Many systems are designed to respond to the needs of acute care rather than chronic conditions, this means hypertensive patients don't always get the best care. Important factors that need to be improved include the availability of essential medications, affordable healthcare, and patient education.

Mobile health technology is a recent and effective way to improve access to hyper- tensive care. Patients can manage and monitor their blood pressure from home with the use of mobile health applications, which can cut down on the number of times the patient will need to visit the hospital. This type of technology can be particularly beneficial for individuals in rural or remote areas.

Early detection and improved management of hypertension is a result of primary care institutions' increased ability to diagnose, treat, and monitor their patients. Expanding the role of community health workers and nurses can also help bridge gaps in care, particularly in underserved areas.

Increasing public knowledge about hypertension and its dangers is essential for encouraging and motivating people to get treatment. Educational campaigns that promote the importance of regular blood pressure checks and lifestyle modifications can help reduce the prevalence of hypertension. It is also important that there are Interventions that are culturally sensitive and target the unique obstacles that various communities encounter.

The government can also play an important role in improving access to hypertension care by subsidizing essential medications, Expanding health insurance policy coverage and implementing national hypertension screening programs. Hypertension can also be avoided by implementing regulations that support a healthier lifestyle, such as lowering the amount of sodium in food items that are being produced [8].

Conclusion to chapter 1

Hypertension is a complex and multifaceted condition characterized by persistently elevated blood pressure, driven by a combination of genetic, environmental, and lifestyle factors. Its pathophysiology involves multiple mechanisms affecting the cardiovascular system, often leading to serious complications such as heart disease, stroke, kidney failure, etc.

Various types and subtypes of hypertension, such as primary, secondary, malignant, isolated systolic, and resistant hypertension, present unique challenges for diagnosis and management. The condition is exacerbated by numerous risk factors, including age, obesity, poor diet, poor lifestyle choices, and underlying medical conditions.

Patients with hypertension face several challenges, including the risk of severe cardiovascular events, difficulties in managing symptoms, and the potential for organ damage if left uncontrolled. Access to adequate healthcare services plays a critical role in managing hypertension effectively. However, economic, geographic, and sociocultural barriers often limit the ability of many individuals to obtain proper diagnosis, treatment, and long-term care, particularly in low resource settings.

To mitigate these challenges, strategies aimed at improving healthcare access for hyper- tension patients must focus on strengthening primary care services, promoting health education, expanding the use of mobile healthcare technologies, and implementing policies that make healthcare more affordable and accessible. By addressing these barriers, healthcare systems can significantly improve the prevention, detection, and management of hypertension, ultimately reducing the burden of this widespread and dangerous condition.

Chapter 2
STUDY OF PREVALENCE AND APPROACHES TO THE TREATMENT PATIENTS WITH HYPERTENSION

2.1 Study of the prevalence of tuberculosis worldwide

The prevalence of hypertension varies widely between regions and demographic groups, but it remains a substantial burden across all populations. According to the World Health Organization (WHO), an estimated 1.28 billion adults aged 30-79 years worldwide have hypertension, with the majority residing in low- and middle-income countries.

In developed countries, approximately 30-45% of the adult population is affected by hypertension. The condition is more common in older adults, with prevalence rates rising significantly with age (Fig 2.1) [9].

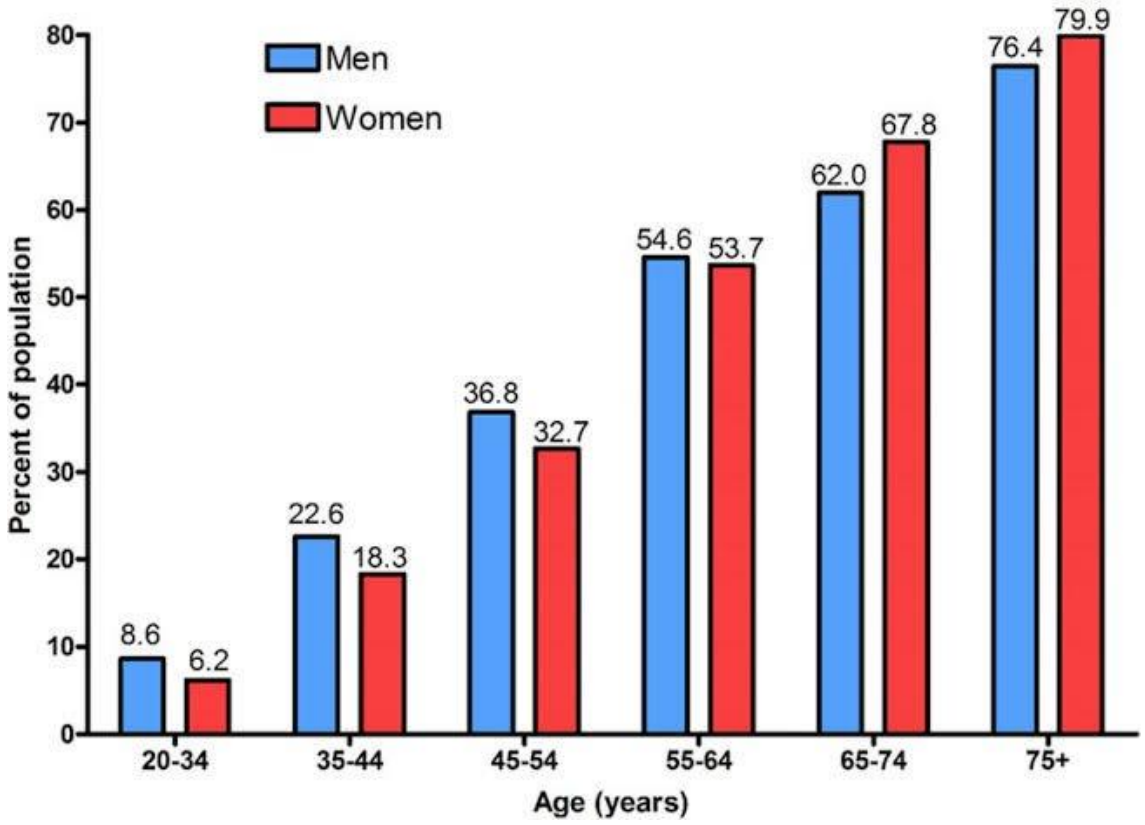

Fig. 2.1 Prevalence of hypertension among adults by age and sex

In the United States, nearly half of the adults (47%) have hypertension, according to data from the Centers for Disease Control and Prevention (CDC).

In sub-Saharan Africa, the prevalence of hypertension has been on the rise, with some studies suggesting that up to 46% of adults may be hypertensive.

Meanwhile, in Southeast Asia, hypertension affects around 25% of the population, with significant urban-rural disparities in prevalence rates (Fig 2.2). [11, 12]

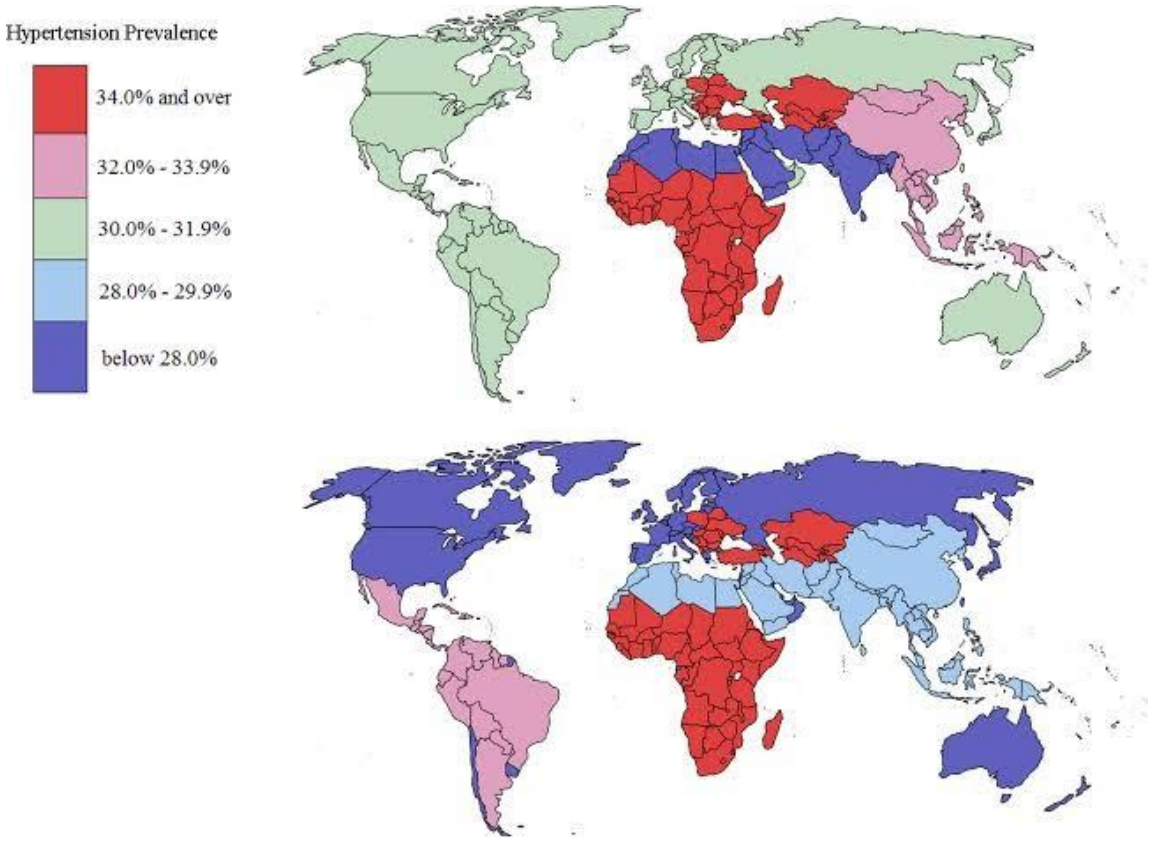

Fig. 2.2 Worldwide prevalence of hypertension

In Nigeria, the burden of hypertension has grown steadily over the past few decades due to a combination of factors such as urbanization, lifestyle changes, and demographic shifts. Hypertension is highly prevalent, affecting a significant portion of the adult population. Studies indicate that the prevalence of hypertension among Nigerian adults ranges from 20% to 40%, de-pending on the population sampled and the diagnostic criteria used.

According to a meta-analysis of studies conducted across Nigeria, the national prevalence of hypertension stands at approximately 30%, with higher

rates reported in urban areas compared to rural regions. The increasing rate of hypertension in Nigeria is consistent with global trends, particularly in sub-Saharan Africa, where the prevalence of the condition has risen in parallel with urbanization and the adoption of Westernized diets and lifestyles [13].

There is also presence of regional variations in the prevalence of hypertension within Nigeria. Urban centers such as Lagos, Abuja, and Port Harcourt report higher prevalence rates, often exceeding 30%, compared to rural areas, where the rates are generally lower but still rising. This urban-rural disparity is largely attributed to lifestyle differences, with urban populations being more likely to consume processed foods, experience higher levels of stress and have a lifestyle characterized by lack of physical activity (Fig 2.3.) [14].

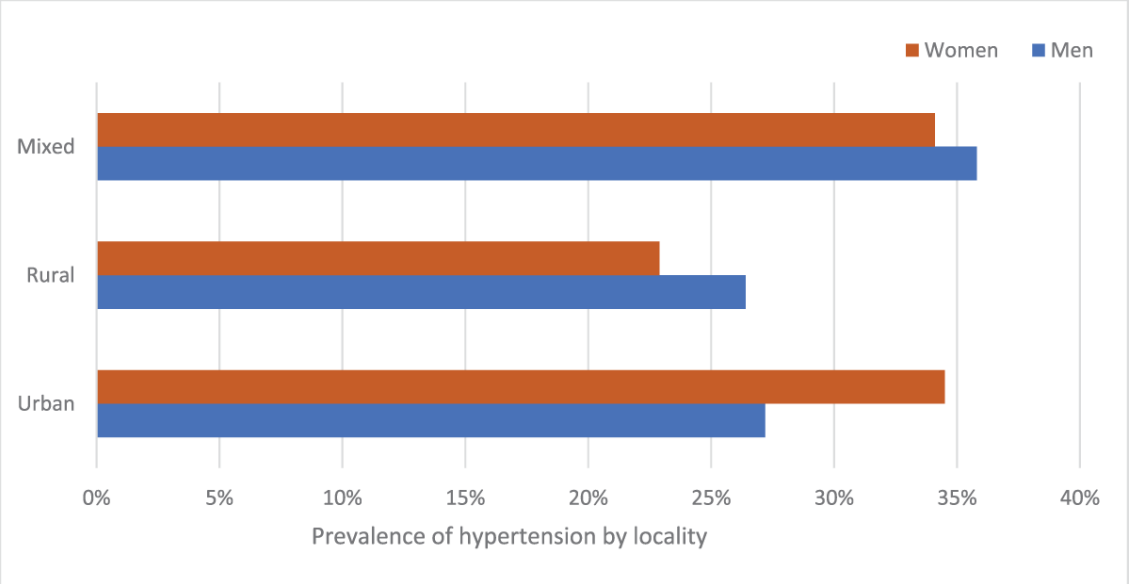

Fig. 2.3 Prevalence of hypertension in Nigeria by locality

In Nigeria, hypertension is a leading cause of illness and mortality. It is a major risk factor for cardiovascular disorders, which make up a sizable amount of the nation's non-communicable diseases mortality. Heart disease, stroke, and chronic renal disease are the most frequent side effects of hypertension, and they all significantly strain Nigeria's healthcare system.

Heart failure and stroke are two major cardiovascular disorders that result from uncontrolled hypertension. Stroke is the second most common cause of

death in Nigeria, and a significant contributing factor to this figure is hypertension (Fig 2.4).

Many people with hypertension don't know they have it, which delays diagnosis and treatment and raises the risk of serious problems.

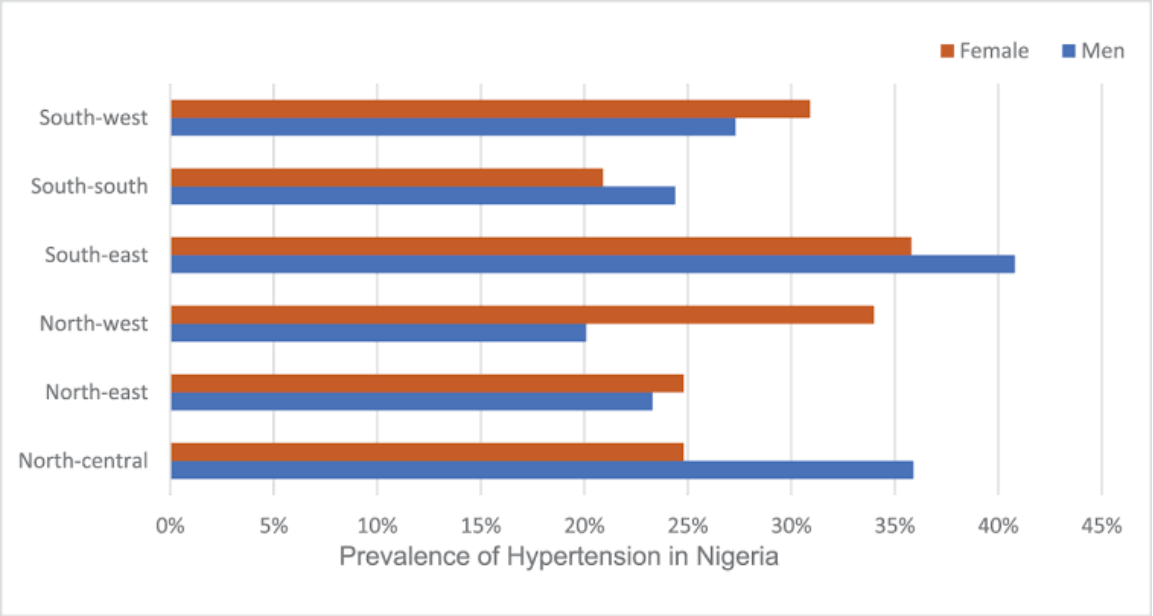

Fig. 2.4 Prevalence of hypertension in Nigeria by locality

2.2 Study of drug therapy treatment of hypertension in accordance with international guidelines

One of the most important aspects of treating hypertension is pharmacological management. Antihypertensive medications fall into a number of types, each of which affects a distinct mechanism involved in blood pressure management. The patient's general health, any comorbidities, and how well they respond to treatment all influence the prescription selection.

Diuretics: Diuretics, also referred to as "water pills," lower blood pressure by eliminating extra water and salt from the body, which lowers blood volume. Thiazides, including hydrochlorothiazide, are common diuretics that are frequently recommended as a first-line treatment for hypertension. Although diuretics are especially beneficial for older patients or those who consume more

sodium, some patients may find the electrolyte imbalances, dehydration, and increased urine to be uncomfortable [15].

Inhibitors of the Angiotensin-Converting Enzyme (ACE): ACE inhibitors, like lisinopril and enalapril, function by preventing angiotensin I from being converted to angiotensin II, a hormone that narrows blood vessels. ACE medications help relax blood arteries and reduce blood pressure by blocking this process. Due to their protective effects on the kidneys, these medications are especially helpful for individuals with diabetes or kidney disease. Nonetheless, frequent adverse effects include high potassium levels, a chronic dry cough, and in rare instances, angioedema (swelling) [16].

Angiotensin II Receptor Blockers (ARBs): ARBs, like valsartan and losartan, inhibit blood vessel constriction by blocking angiotensin II's action at its receptor sites. Patients who are unable to take ACE inhibitors because of adverse effects like coughing are frequently prescribed ARBs. They have similar effects as ACE inhibitors , but differ in their mechanisms [17].

Blockers of calcium channels (CCBs): Calcium channel blockers, like amlodipine and nifedipine, help relax blood vessels and lessen the burden on the heart by preventing calcium from entering the heart's muscle cells and blood vessels. The heart and blood vessels have to work harder to pump calcium. Calcium channel blockers expand blood vessels and facilitate the heart's pumping action by slowing the flow of calcium into the heart's cells and blood vessel walls. Patients who cannot tolerate other antihypertensive drugs or who have isolated systolic hypertension are frequently treated with CCBs. Fatigue, lightheadedness, and ankle edema are typical adverse effects [18].

Beta blockers: Metoprolol and atenolol are examples of beta blockers that lower blood pressure by reducing the heart rate and lessening the force of the heart's contractions. Patients with hypertension who also have other cardiovascular disorders, like heart disease or arrhythmias, are frequently administered them. In most cases, beta blockers are not the first choice of treatment for hypertension unless [19].

Combination Treatment. For the best blood pressure control, many hypertensive patients need to take multiple medications. Because it targets several pathways involved in blood pressure regulation, combina-tion therapy, which employs medications from various classes is frequently more effective than monotherapy, or the use of a single medication. ARBs or ACE inhibitors are frequently used with calcium channel blockers or diuretics. Combination therapy can raise the risk of adverse effects, which makes adherence more difficult even though it increases efficacy [20].

Medication adherence is one of the most important aspects of managing hypertension; it has been found that a significant percentage of hypertensive patients do not take their medications as directed, either because they forget, because of side effects, or because they do not understand the importance of consistent treatment. Patient education, medication reminders, and simplified dosing regimens are strategies to improve adherence.

2.3 Analysis of WHO essential medicine list and Nigerians essential medicine list Essential Medicines for Hypertension

Effective management of hypertension relies heavily on access to antihypertensive medications. Different countries maintain national lists of essential medications, while international organizations, such as the World Health Organization (WHO), create broader, global guidelines to ensure equitable access to critical drugs. Here, I compared the presence and availability of anti-hypertensive drugs on the Nigerian national list and the international list, focusing on the range of available drugs, highlighting the similarities, differences, therapeutic alternatives, treatment recommendations and potential implications for hypertension management in Nigeria.

The table 2.1 shows WHO international list of essential medicines in part of medication which can be used for treatment hypertension [21].

Table 2.1

Medications which can be used for hypertension treatment presented in WHO Model list of essential medicines

12.2 Antiarrhythmic medicines	
bisoprolol Therapeutic alternatives: - carvedilol - metoprolol	**Tablet:** 1.25 mg; 5 mg.
digoxin	**Injection:** 250 micrograms/mL in 2 mL ampoule. **Oral liquid:** 50 micrograms/mL. **Tablet:** 62.5 micrograms; 250 micrograms
epinephrine (adrenaline)	**Injection:** 100 micrograms/mL (as acid tartrate or hydrochloride) in 10 mL ampoule.
lidocaine	**Injection:** 20 mg/mL (hydrochloride) in 5 mL ampoule.
verapamil	**Injection:** 2.5 mg/mL (hydrochloride) in 2 mL ampoule. **Tablet:** 40 mg; 80 mg (hydrochloride).
Complementary List	
amiodarone	**Injection:** 50 mg/mL (hydrochloride) in 3 mL ampoule. **Tablet:** 100 mg; 200 mg; 400 mg (hydrochloride).
12.3 Antihypertensive medicines	
amlodipine Therapeutic alternatives: - 4th level ATC chemical subgroup (C08CA Dihydropyridine derivatives)	**Tablet:** 5 mg (as maleate, mesylate or besylate).
bisoprolol Therapeutic alternatives: - atenolol* - carvedilol - metoprolol	**Tablet:** 1.25 mg; 5 mg. *atenolol should not be used as a first-line agent in uncomplicated hypertension in patients > 60 years
enalapril Therapeutic alternatives: - 4th level ATC chemical subgroup (C09AA ACE inhibitors, plain)	**Oral liquid:** 1 mg/mL (as hydrogen maleate) [c]. **Tablet:** 2.5 mg; 5 mg; 10 mg (as hydrogen maleate).
hydralazine*	**Powder for injection:** 20 mg (hydrochloride) in ampoule. **Tablet:** 25 mg; 50 mg (hydrochloride). *Hydralazine is listed for use only in the acute management of severe pregnancy-induced hypertension. Its use in the treatment of essential hypertension is not recommended in view of the evidence of greater efficacy and safety of other medicines.

Continuation of the table 2.1

□ hydrochlorothiazide Therapeutic alternatives: - chlorothiazide - chlorthalidone - indapamide	**Oral liquid:** 50 mg/5 mL. **Solid oral dosage form:** 12.5 mg; 25 mg.
□ lisinopril + □ amlodipine Therapeutic alternatives: - 4th level ATC chemical subgroup (C09AA ACE inhibitors, plain) (for lisinopril) - 4th level ATC chemical subgroup (C08CA Dihydropyridine derivatives) (for amlodipine)	**Tablet:** 10 mg + 5 mg; 20 mg + 5 mg; 20 mg + 10 mg.
□ lisinopril + □ hydrochlorothiazide Therapeutic alternatives: - 4th level ATC chemical subgroup (C09AA ACE inhibitors, plain) (for lisinopril) - chlorthalidone, chlorothiazide, indapamide (for hydrochlorothiazide)	**Tablet:** 10 mg + 12.5 mg; 20 mg + 12.5 mg; 20 mg + 25 mg.
□ losartan Therapeutic alternatives: - 4th level ATC chemical subgroup (C09CA Angiotensin II receptor blockers (ARBs), plain)	**Tablet:** 25 mg; 50 mg; 100 mg.
methyldopa*	**Tablet:** 250 mg. *Methyldopa is listed for use only in the management of pregnancy induced hypertension. Its use in the treatment of essential hypertension is not recommended in view of the evidence of greater efficacy and safety of other medicines.
□ telmisartan + □ amlodipine Therapeutic alternatives: - 4th level ATC chemical subgroup (C09CA Angiotensin II receptor blockers (ARBs), plain) (for telmisartan) - 4th level ATC chemical subgroup (C08CA Dihydropyridine derivatives) (for amlodipine)	**Tablet:** 40 mg + 5 mg; 80 mg + 5 mg; 80 mg + 10 mg.
□ telmisartan + □ hydrochlorothiazide Therapeutic alternatives: - 4th level ATC chemical subgroup (C09CA Angiotensin II receptor blockers (ARBs), plain) (for telmisartan) - chlorthalidone, chlorothiazide, indapamide (for hydrochlorothiazide)	**Tablet:** 40 mg + 12.5 mg; 80 mg + 12.5 mg; 80 mg + 25 mg.
Complementary List	
sodium nitroprusside	**Powder for infusion:** 50 mg in ampoule

Nigerian List of Essential Medicines in part of medication which can be used for treatment hypertension is presented at Table 2.2 [22]

Table 2.2

Nigerian List of Essential Medicines in part of medication which can be used for treatment hypertension

Amiloride + hydrochlorothiazide	**Tablet:** 2.5 mg + 25 mg.
Amlodipine	**Tablet:** 5 mg; 10 mg (besy-late).
Atenolol	**Tablet:** 25 mg; 50 mg; 100mg.
Bendrofluazide	**Tablet:** 2.5 mg; 5 mg.
Captopril	**Tablet:** 12.5 mg; 25 mg; 50mg.
Enalapril	**Tablet:** 5 mg; 10 mg.
Hydrochlorothiazide	**Tablet:** 12.5 mg; 25 mg.
Hydralazine	**Powder for Injection:** 20 mgin ampoule. **Tablet:** 25 mg; 50 mg.
Indapamide	**Tablet:** 1.5 mg; 2.5 mg.
Labetalol	**Powder for Injection:** 5 mg/ mL in 20-mL ampoule.
	Tablet: 100 mg; 200 mg.
Lisinopril	**Tablet:** 5 mg; 10 mg.
Losartan	**Tablet:** 25 mg; 50 mg.
Methyldopa	**Tablet:** 250 mg; 500 mg.
Nifedipine	**Tablet:** 20 mg. **Tablet (slow release):** 30 mg.
Nimodipine	**Tablet:** 30 mg.
Propranolol	**Tablet:** 40 mg; 80 mg.
Telmisartan	**Tablet:** 40 mg; 80 mg.

Common Antihypertensive Drugs on Both Lists

Several antihypertensive drugs are shared between the Nigerian National List and the International List, reflecting their global importance in managing hypertension. Both the national and international lists include a variety of antihypertensive drugs that represent major drug classes, such as calcium channel blockers, beta-blockers, angiotensin-converting enzyme (ACE) inhibitors, and angiotensin II receptor blockers (ARBs). However, the lists differ in their specific formulations and therapeutic alternatives. These include:

- **Amlodipine**: A widely used calcium channel blocker, available in both lists in similar formulations (5 mg and 10 mg tablets). It is essential in treating hypertension, particularly for patients with high cardiovascular risk.
- **Enalapril**: An ACE inhibitor available on both lists. The Nigerian list offers it in 5 mg and 10 mg tablets, while the international list provides it in similar strengths with an additional option of an oral liquid (1 mg/mL), which may provide more flexibility in treatment, particularly for patients with swallowing difficulties.
- **Hydrochlorothiazide**: A thiazide diuretic, available in both lists in 12.5 mg and 25 mg tablets. It is a cornerstone in hypertension management due to its efficacy in reducing blood pressure and preventing cardiovascular complications.
- **Losartan**: An angiotensin II receptor blocker (ARB) found in both lists (25 mg and 50 mg tablets). This drug is frequently prescribed for patients who cannot tolerate ACE inhibitors.
- **Methyldopa**: Listed on both the Nigerian and international lists primarily for pregnancy-induced hypertension. Both lists recommend it in 250 mg tablets, with the Nigerian list also including a 500 mg option.

The comparison shows that while there are commonalities in the core drugs listed, the international list offers more therapeutic alternatives and guidance, particularly when first-line options are contraindicated or less effective in specific populations.

Differences in Available Drugs and Formulations

While there is overlap in essential antihypertensives, there are also notable differences between the Nigerian national list and the international list, especially in terms of available therapeutic alternatives and combinations:

- **Bisoprolol**: This beta-blocker appears on the international list but is absent from the Nigerian list. In contrast, Atenolol is present in both lists but is noted on the international list as not recommended as a first-line agent in patients over 60 years due to its inferior performance in reducing cardiovascular risk

compared to other options. Nige-ria's reliance on atenolol over bisoprolol may reflect limited access to more modern beta-blockers.

- **Therapeutic Alternatives:** The international list offers extensive therapeutic alternatives, such as chlorthalidone, chlorothiazide, and indapamide as alternatives to hydrochlorothiazide. The Nigerian list includes indapamide but lacks some of the other alternatives, potentially limiting the flexibility of treatment options in the case of drug shortages or patient-specific contraindications.
- **Drug Combinations**: The international list includes fixed-dose combinations such as lisinopril + amlodipine and telmisartan + amlodipine, which can enhance patient compliance by reducing the pill burden. The Nigerian list does not provide these combination therapies, meaning that patients in Nigeria may need to take multiple drugs separately, which could affect adherence to treatment.
- **Hydralazine**: Both lists include hydralazine, but the international list restricts its use to pregnancy-induced hypertension, whereas the Nigerian list lacks such restrictions, potentially leading to broader use of this older medication, which has been surpassed by more effective and safer alternatives for essential hypertension.

Medications Exclusive to the Nigerian List

The Nigerian national list includes some antihypertensive drugs that do not appear on the international list, such as:

- **Nifedipine**: A calcium channel blocker available on the Nigerian list in 20 mg and 30 mg slow-release formulations. While nifedipine is widely used for hypertension, it does not appear on the international list, which favors amlodipine as the preferred dihydropyridine derivative due to its superior safety profile and longer duration of action.
- **Propranolol**: Another beta-blocker on the Nigerian list but absent from the international list. Propranolol is less commonly used for hypertension today due to the availability of newer, more selective beta-blockers like bisoprolol and

carvedilol, which offer better outcomes for patients with comorbid conditions like heart failure.

- **Reserpine**: Listed on the Nigerian list in combination with dihydroergocristine and clopamide. This older antihypertensive drug is no longer favored internationally due to its significant side effects and the availability of more effective alternatives. Its continued presence on the Nigerian list may reflect cost considerations or limited access to newer drugs in some areas of the country.

Medications for Special Populations and Conditions

Both lists include drugs tailored to specific hypertension-related conditions, such as pregnancy-induced hypertension or heart failure. The international list restricts certain drugs, like methyldopa and hydralazine, for use only in pregnancy-induced hypertension, as evidence sup-ports their safety in this context. The national list also includes methyldopa and hydralazine but does not make such clear distinctions, reflecting less specific guidance on their use.

The international list also includes combinations of antihypertensive drugs such as lisinopril + hydrochlorothiazide or telmisartan + amlodipine, providing an alternative for patients needing multi-drug therapy. The national list however, does not include such explicit restrictions, which may lead to broader use of these medications outside pregnancy.

Recommendations and Usage

The international list provides more specific recommendations for the use of certain drugs, reflecting up-to-date clinical guidelines. For instance, it notes that atenolol should not be used as a first-line treatment for patients over 60 years old, aligning with research suggesting it may be less effective in reducing cardiovascular risk in this population. The national list does not include such detailed recommendations, which may result in broader or less targeted use of certain medications.

Implications for Healthcare Access in Nigeria

The differences in drug availability and formulation between the Nigerian and international lists have significant implications for healthcare access and outcomes in Nigeria. While Nigeria has access to many of the essential drugs needed to manage hypertension, the limited therapeutic alternatives and absence of combination therapies may reduce treatment flexibility and patient adherence. The reliance on older drugs, such as Atenolol, Propranolol, and Reser- pine, reflects the need for modernization of the national list to align with current international guidelines and improve patient outcomes.

The absence of newer drug combinations, which are favored internationally for their convenience and efficacy, could also impact adherence, particularly in rural areas where access to healthcare providers and pharmacies is limited. By modernizing the national list to include more of the alternatives and combination therapies seen in the international list, Nigeria could improve the effectiveness of hypertension management, reduce complications, and improve long-term cardiovascular outcomes.

2.4 Comparison Analysis of Nigerian hypertension guidelines with Global Standards

Hypertension management in Nigeria is shaped by both national protocols and international frameworks, particularly those from organizations such as the World Health Organization (WHO) and the International Society of Hypertension (ISH). The Nigerian Hypertension Society (NHS) has also developed localized guidelines that reflect the country's unique needs, especially in resource constrained areas [23].

The core components of the Nigerian guidelines are as follows:

Diagnosis: Hypertension is defined as a persistent systolic blood pressure (SBP) of 140 mm Hg or more, or a diastolic blood pressure (DBP) of 90 mm Hg or more, consistent with WHO-ISH and other global standards.

Risk Assessment: Patients are categorized based on their blood pressure readingsand the presence of additional risk factors, such as advanced age, obesity, diabetes, and family history of cardiovascular disease.

Pharmacological Treatment: The Nigerian guidelines advise starting treatment based on the severity of hypertension and associated risk factors, typically with first-line medications like diuretics, calcium channel blockers, ACE inhibitors, and angiotensin II receptor blockers (ARBs).

Lifestyle Modifications: These guidelines also emphasize non-drug interventions, including dietary changes (reducing salt and fat intake), increasing physical activity, stop- ping smoking, and limiting alcohol consumption.

In comparison with global guidelines—such as those from the American College of Cardiology (ACC), the European Society of Cardiology (ESC), and the WHO—both similarities anddifferences can be observed.

Diagnostic Thresholds: The Nigerian guidelines, like those from WHO and ISH,recommend diagnosing hypertension at a blood pressure of 140/90 mm Hg. However, the2017 ACC/AHA guidelines lowered this threshold to 130/80 mm Hg. This more aggressive approach has not been widely adopted in Nigeria, likely due to the challenges of implementing more intensive interventions in a low-resource setting.

Pharmacological Treatments: Nigerian treatment guidelines are largely in line with global standards when it comes to drug selection. Diuretics and calcium channel blockers are preferred as first-line treatments in Nigeria, reflecting similar preferences for these medications globally, particularly in African populations, where they have proven effective. However, access to certain drugs like ACE inhibitors and ARBs may be more limited in Nigeria due to cost constraints.

Cost and Availability: A key difference between Nigerian and global guidelines isthe focus on affordability and accessibility of treatments. In Nigeria, where a significant portion of the population lives in poverty and healthcare costs are often paid out-of-pock- et, there is a strong emphasis on cost-effective

treatment strategies. Generic medications are widely used, whereas more expensive, newer medications that are common in countries like the U.S. or Europe are less emphasized.

Healthcare Infrastructure and Follow-up: The Nigerian guidelines take into account the limitations of the healthcare system, particularly in rural areas where access to healthcare providers and regular follow-up care can be difficult. As a result, simpler and more cost-effective treatment plans are prioritized. In contrast, global guidelines often assume the availability of advanced medical technology, regular follow-up appointments, and continuous monitoring, which are less feasible in many parts of Nigeria.

Public Health Education and Campaigns: Unlike in wealthier countries such as the U.K. or U.S., where structured public health campaigns on hypertension prevention are common, Nigeria faces challenges in running widespread, long-term campaigns due to limited healthcare funding and competing national priorities. This makes it difficult to raise widespread awareness of the risks and management of hypertension.

Conclusion to chapter 2

In comparing the presence of antihypertensive drugs on national and international lists, it is evident that Nigeria includes many essential drugs that align with global standards but it is also clear that there is significant overlap in the core medications used to treat hypertension.

There are gaps in the availability of therapeutic alternatives and modern combination therapies, which are crucial for enhancing treatment flexibility and patient adherence. The international list offers greater flexibility, more therapeutic alternatives, and clearer guidelines for special populations. The national list, while comprehensive, provides fewer options and less de- tailed guidance, potentially limiting its utility in complex cases or for patients with specific needs.

To improve hypertension management at a national level, countries could consider incorporating more of the therapeutic alternatives and guidelines present in international lists. This would enhance the flexibility of treatment and ensure that patients have access to the most effective and up-to-date therapies, ultimately improving health outcomes for individuals living with hypertension.

Chapter 3
RESEARCH ON SOCIOECONOMIC FACTORS AFFECTING HYPERTENSION IN NIGERIA

3.1 Research on affordability of hypertension drugs in Nigeria

Hypertension is a critical public health issue in both developed and developing countries. It significantly contributes to the global burden of cardiovascular diseases, which remain the leading cause of mortality.

In Nigeria, it represents a significant health challenge due to its increasing prevalence and associated complications. Various factors contribute to the rise in hypertension cases, with socioeconomic issues playing a central role in exacerbating the condition. While medical and life- style factors are well-documented, the role of socioeconomic determinants in the prevalence and management of hypertension is critical yet often overlooked.

One of the most significant socioeconomic determinants of hypertension is income. Low-er income individuals are more likely to experience stress, which is a major contributor to hyper-tension.

Poverty remains one of the major socioeconomic factors impacting health outcomes in Nigeria, particularly in relation to hypertension. According to the National Bureau of Statistics (NBS), about 40% of Nigerians live below the poverty line. [24]

This condition of poverty limits access to proper nutrition, which is essential for maintaining a healthy blood pressure. Many individuals rely on cheaper, processed foods, contributing to weight gain and hypertension.

Additionally, Income also affects access to healthcare. The economic strain caused by poverty makes it difficult for affected individuals to access healthcare services for regular monitoring or treatment of hypertension. Individuals with limited financial resources may forgo regular health checkups,

preventive measures, or treatment for hypertension due to the cost of medical care, leading to undiagnosed or poorly managed hypertension. [25]

Access to healthcare is a fundamental socioeconomic determinant of hypertension. [29] Nigeria's healthcare system faces significant challenges, especially for individuals in rural areas or from low-income households. Access to healthcare is often inadequate due to underfunded public health systems, lack of infrastructure, and insufficient healthcare professionals.

For hypertension, early detection is key to managing the disease and preventing complications, but many Nigerians do not have access to regular blood pressure screenings. As a result, many individuals with hypertension are undiagnosed or inadequately treated, increasing the risk of severe health complications.

Unemployment in Nigeria is a major contributor to economic stress, which can directly and indirectly affect hypertension. High unemployment rates, currently estimated at around 20%, increase financial instability, leading to anxiety and stress, which are known risk factors for high blood pressure. [26]

Also, unemployed individuals are more likely to engage in unhealthy coping mechanisms such as alcohol consumption and smoking, both of which exacerbate hypertension. Without stable income, individuals cannot prioritize healthcare expenditures, thereby reducing their ability to manage the condition effectively.

The type of occupation one holds is another key socioeconomic determinant of hypertension. Certain jobs, particularly those that are low wage, high demand, and offer little job security, are associated with higher levels of stress, which contributes to elevated blood pressure. Blue-col-lar workers, for example, often face physically demanding jobs with limited control over work schedules, leading to chronic stress, poor sleep, and unhealthy coping mechanisms such as smoking or drinking alcohol.

Additionally, job-related stress can be heightened in professions that require long hours or expose workers to hazardous environments.

Education plays a vital role in health awareness, including knowledge about the causes, risks, and prevention of hypertension [27].

In Nigeria, there is a direct correlation between lower levels of education and poor health outcomes. Many Nigerians, particularly in rural areas, lack adequate health education, which limits their ability to make informed decisions regarding lifestyle and diet. They may not fully understand the importance of regular physical activity, a balanced diet, and routine blood pressure checks. However, misconceptions about hypertension and traditional health beliefs often delay treatment.

This lack of awareness contributes to the growing prevalence of the condition, as many people are unaware of the silent nature of hypertension and its long-term consequences. People with higher levels of education tend to have better health literacy, enabling them to understand the importance of a healthy lifestyle and the management of chronic diseases like hypertension.

Nigeria is experiencing rapid urbanization, with more people migrating from rural areas to urban centers in search of better economic opportunities. However, urbanization has brought about significant changes in lifestyle that contribute to the increase in hypertension cases [28].

Urban living often leads to sedentary lifestyles due to reduced physical activity, increased consumption of fast food, and greater exposure to pollution and stress. In cities, people may also have easier access to unhealthy food options, particularly processed foods that are high in sodium and fat. This shift from traditional diets rich in fruits and vegetables to more Westernized diets has been linked to the rise in non-communicable diseases, including hypertension.

Socioeconomic status often determines the quality of one's living environment, which significantly impacts the likelihood of developing hypertension. Individuals in low-income neighborhoods are more likely to be exposed to environmental stressors such as noise pollution, crime, and poor housing conditions. The chronic stress associated with these living environments is a known contributor to high blood pressure. Poor living conditions can also

limit access to healthcare facilities, grocery stores that sell fresh produce, and recreational spaces for physical activity.

National health insurance scheme medicines price list for hypertension is presents in Annex A.

Hypertension, or high blood pressure, is a significant global health issue, and its management relies heavily on pharmacological interventions. Various classes of antihypertensive drugsare available, ranging in price and formulation. This analysis categorizes these drugs into three price groups—low, middle, and high—based on their unit price.

Drugs in the low-price group generally cost between 15 and 30 Nigerian Naira (NGN) pertablet. These medications are often older, widely available, and in generic formulations. Despite their lower cost, they are effective in controlling hypertension and are widely used, particularly in resource-limited settings. For example: Amlodipine (5 mg): 20.00, Atenolol (25 mg): 16.00, Atenolol (50 mg): 18.00, Captopril (25 mg): 20.00, Carvedilol (3.125 mg): 21.00, Captopril (50 mg): 57.07.

These low-cost options are primarily composed of single-drug formulations like Atenolol, Amlodipine, and Captopril. They tend to be the first line of treatment for many patients with un- complicated hypertension.

The middle-price group includes drugs priced between 30 and 100 Naira per tablet. These medications are often combination therapies or newer drugs, offering broader mechanisms of action and sometimes improved efficacy in patients with comorbid conditions. These drugs are priced moderately and reflect a balance between cost and therapeutic benefit. For example: Candesartan Cilexetil (8 mg): 64.00, Felodipine (5 mg): 80.00, Labetalol (200 mg): 82.00, Telmisartan (40 mg): 80.00, Telmisartan (80 mg): 90.00, Valsartan (80 mg): 95.00

The middle-priced drugs often feature ARBs (Angiotensin II Receptor Blockers) like Telmisartan and Valsartan. These drugs are especially favored for

patients who cannot tolerate ACE inhibitors. Combinations, such as Irbesartan with Amlodipine, are also common in this price range.

Drugs in the high-price category exceed 100 Naira per tablet. These medications are often complex combinations or involve newer agents that offer added convenience (e.g., single-pill combinations) or target patients with specific treatment needs (e.g., resistant hypertension or co- morbidities like diabetes or heart disease). For example:

Amlodipine + Valsartan (10/160mg): 160.00, Amlodipine + Valsartan + HCT (10/160/12.5mg): 260.00, Perindopril + Indapamide (10/2.5mg): 220.00, Lacidipine (2mg): 300.00, Perindopril Arginine + Amlodipine (5mg/10mg): 242.00, Perindopril Arginine + Am-lodipine (5mg/5mg): 240.00

The high-price group includes combinations of multiple antihypertensive drugs, such as Amlodipine with Valsartan and Hydrochlorothiazide (HCT), which provide a comprehensive approach to managing hypertension. These drugs are designed for patients who need more aggressive blood pressure control and are more likely to be prescribed for individuals with complicated hypertension profiles.

Access to affordable healthcare, particularly for chronic conditions like hypertension, re- mains a challenge in many developing countries, including Nigeria. The economic availability of antihypertensive drugs is crucial for effective long term management, seeing as hypertension re- quires consistent and often life long treatment.

3.2 Analysis of factors influencing the economic availability of hypertensive drugs in Nigeria.

In Nigeria, the cost of antihypertensive drugs varies widely, with prices ranging from as low as 15 NGN per tablet to over 300 NGN per tablet. The availability of low-cost generic drugs, such as Atenolol, Captopril, and

Amlodipine, offers economically viable options for a large seg- ment of the population.

These drugs, which fall into the low-price category, are crucial for making hypertension treatment accessible to the masses. For example, Amlodipine (5mg) and Atenolol (25mg) are priced at 20 NGN and 16 NGN per tablet, respectively. Given that these medications are often first-line treatments, they are integral to healthcare programs targeting hypertension in lower-in-come populations.

However, the affordability of more complex drug combinations, such as Amlodipine with Valsartan or Perindopril with Indapamide, which fall into the middle and high-price categories, may pose challenges for many patients. Prices for these drugs can range from 160 NGN to over 300 NGN per tablet. For instance, Amlodipine + Valsartan (10 mg / 160 mg) is priced at 160 NGN, while Perindopril + Indapamide (10/2.5 mg) costs 220 NGN per tablet. These drugs are often pre-scribed for patients with more resistant or severe hypertension, yet their higher costs can limit accessibility, especially for uninsured or low-income individuals.

Nigeria's healthcare system is supported by the National Health Insurance Scheme (NHIS), which plays a significant role in making medications more accessible. However, cover- age under NHIS is not universal, and a large proportion of the population, especially in rural areas, remains uninsured. For patients with health insurance, out-of-pocket costs for antihypertensive medications are often reduced, making higher-cost medications more accessible. In contrast, uninsured individuals must bear the full cost of treatment, which can be prohibitive, particularly for high-priced drugs.

Despite efforts to expand insurance coverage, many Nigerians still rely on direct purchases from pharmacies, which disproportionately affects those with lower incomes. For individuals earning the minimum wage or living in poverty, even low-cost antihypertensive drugs can be a financial burden, especially given the chronic nature of the condition. The economic challenge is exacerbated by the need for continuous, long-term therapy, which accumulates significant costs over time.

Socioeconomic disparities significantly affect access to hypertension treatment in Nigeria. Urban areas tend to have better healthcare infrastructure, more pharmacies, and a broader selection of antihypertensive drugs, including generics and brand-name medications. In contrast, rural regions often face limited availability of both healthcare facilities and essential medicines. This disparity in access compounds the economic challenges, as patients in rural areas may need to travel long distances to obtain their medications, further increasing the overall cost of treatment.

Additionally, Nigeria's economic volatility, including inflation and currency fluctuations, affect the price of imported drugs and active pharmaceutical ingredients (APIs) needed for local production. While Nigeria does produce some generic medications domestically, many antihypertensive drugs are still imported, making their prices susceptible to economic conditions. This adds to the financial burden on patients, particularly for drugs in the middle and high-price categories, which are often imported.

The Nigerian government has initiated several programs aimed at improving access to essential medicines, including antihypertensives. Policies focused on generic drug promotion, price controls, and subsidies could play a vital role in increasing the affordability and availability of these medications. However, the effectiveness of these policies is often hampered by inconsistent implementation, regulatory challenges, and corruption within the healthcare system.

In recent years, the government has been working on expanding the NHIS and increasing access to essential medications through the Basic Healthcare Provision Fund (BHCPF). While these efforts are promising, they need to be scaled up to ensure that antihypertensive medications are consistently affordable and accessible to all segments of the population.

With an estimated prevalence of over 30% among the adult population, hypertension presents a significant public health challenge in Nigeria. In

response, various programs and policies have been implemented to improve the prevention, diagnosis, and treatment of hypertension across the country.

The Nigerian government has made efforts to address the growing burden of hypertension through a range of healthcare policies and programs. Key among these is the National Health Insurance Scheme (NHIS), which seeks to improve access to healthcare services, including treatment for chronic diseases such as hypertension. Under the NHIS, some essential antihypertensive medications are covered, which reduces out-of-pocket costs for patients. However, the scheme's reach is still limited, with many Nigerians, especially those in rural areas and those working in the informal sector remaining uninsured.

This highlights the need for expanding health insurance coverage to a broader segment of the population to ensure consistent access to treatment.

Primary healthcare centers (PHCs) play a critical role in the management of hypertension in Nigeria. These centers serve as the first point of contact for most patients and are integral to diagnosing and managing hypertension, especially in rural and underserved areas. Screening pro- grams at PHCs are essential for early detection, as hypertension often presents without noticeable symptoms.

Several non-governmental organizations (NGOs) and international bodies have partnered with the Nigerian government to support hypertension screening and treatment programs. For ex- ample, the World Health Organization (WHO), in collaboration with local healthcare authorities, has launched initiatives to increase blood pressure screening and promote awareness about hyper- tension risks.

The World Health Organization's HEARTS technical package serves as the inspiration for the comprehensive, multi-level care model used by the Hypertension Treatment in Nigeria (HTN) Program. [30] A standardized treatment protocol, a health information management system, team- based care, training and monitoring, patient registration and grouping, and a drug revolving fund to increase access to prescription drugs are all components of this strategy.

One example of providing comprehensive hypertension management in primary care set- tings is the HTN Program. The HTN package's main components are:

(1) a national policy-level standardized treatment protocol;

(2) health system-level promotion of fixed-dose combination therapy;

(3) health system-level patient registration and grouping;

(4) healthcare worker-level incentives for team-based care; and

(5) provided health coaching and home blood pressure monitoring (at the level of patients).

A drug revolving fund was also established by the HTN Program to increase access to blood pressure-lowering drugs. The HTN Program could assist and lower the burden of hypertension disease in Nigeria while operating as a model for providing integrated non communicable diseases (NCD) care in primary care if it is maintained and expanded through adoption and implementation in standard public health policies and practices. There are 60 participating facilities, and a separate drug revolving fund is used to provide cheap bulk purchase, addressing medication access and affordability. This tactic is crucial for maintaining a steady supply of reasonably priced, high quality medications and avoiding treatment disruptions, which can impair blood pressure management.

Community health extension workers' telephone based and in-home health coaching, along with home blood pressure monitoring, are important patient-level strategies that help people learn more about hypertension and increase their autonomy and self efficacy in managing their condition over the long term. The sustainability of the HTN Program is further enhanced by the high level of local ownership and capacity building. Reliance on outside partners is decreased because the majority of healthcare workers are tenured healthcare professionals incorporated into PHCs. Effective scale-up for a wider population impact can be facilitated by methodical implementation employing progressive regional growth. Results from the HTN Program are encouraging; during the previous

four years, nearly 21,000 patients had a more than 50% hypertension control rate.

Implementation Package for Hypertension Treatment in Nigeria Program is presented on Fig. 3.1

Addressing hypertension in Nigeria requires a multi-faceted approach. Expanding the NHIS to include more individuals, particularly those in the informal sector and rural areas, is a crucial step in improving access to healthcare and medications. Strengthening the healthcare workforce through targeted training programs for PHC workers can enhance the quality of care provided to hypertensive patients.

Public health campaigns focused on raising awareness about hypertension, its risk factors, and the importance of regular screening can play a significant role in reducing the burden of the disease.

Finally, improving the distribution of medications and reducing their cost through government subsidies or partnerships with pharmaceutical companies can ensure that patients have consistent access to the drugs they need.

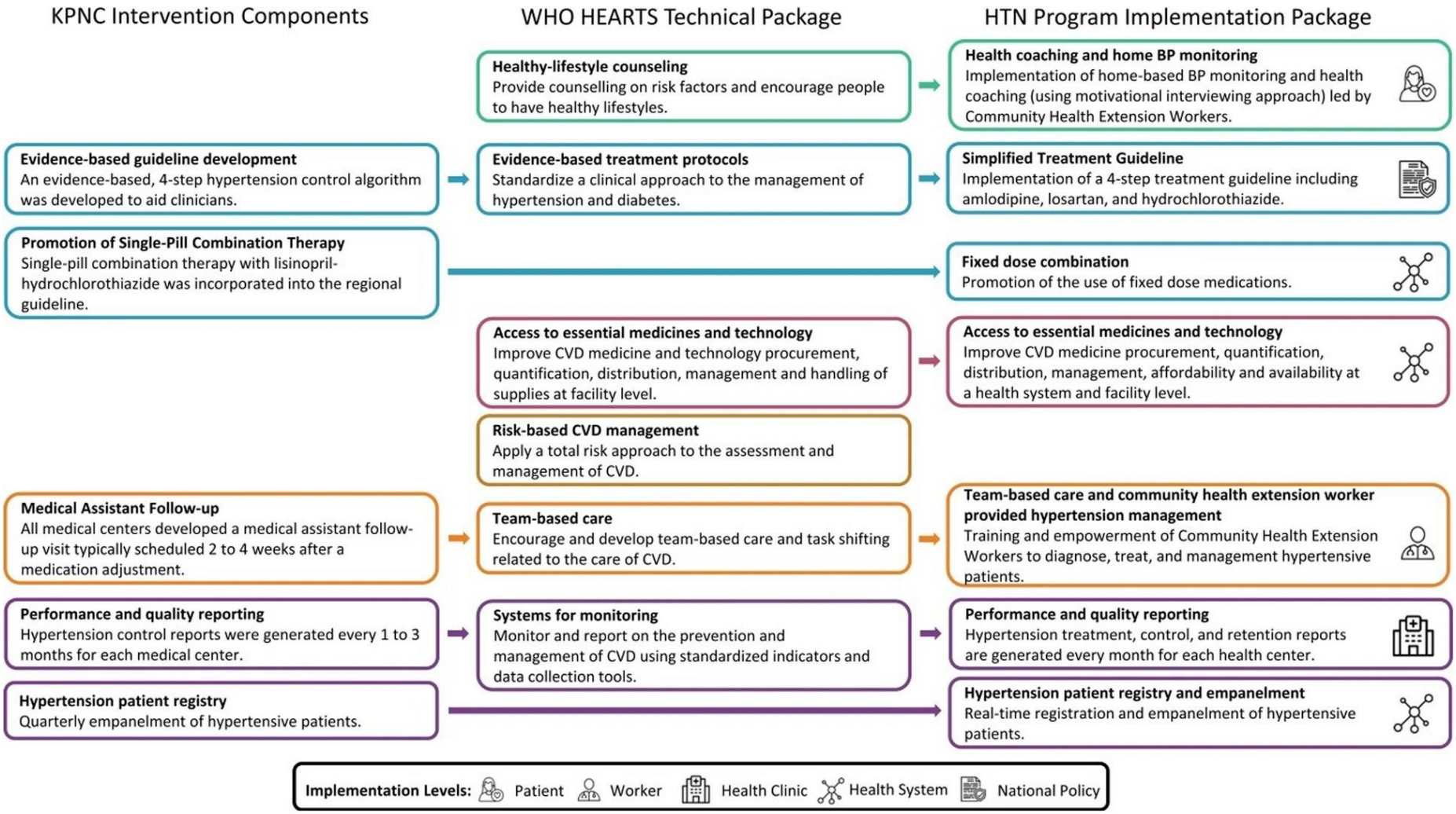

Fig 3.1 Implementation Package for Hypertension Treatment in Nigeria Program

Conclusion to chapter 3

Hypertension is a multifaceted public health issue in Nigeria that is deeply intertwined with the country's socioeconomic conditions. It is not solely a medical condition influenced by individual lifestyle choices. Poverty, limited access to healthcare, unemployment, low education-al attainment, urbanization, and social inequality all contribute to the rising prevalence of hyper- tension.

Addressing hypertension on a societal level requires tackling these root socioeconomic causes. Addressing these socioeconomic factors is crucial for effectively managing and reducing hypertension cases in Nigeria. Efforts to combat hypertension should include improving health- care accessibility, enhancing public health education, promoting healthy lifestyles, and reducing poverty through economic development programs. Without addressing the underlying socioeconomic determinants, the burden of hypertension will continue to rise, posing a serious threat to public health and the economy.

The economic availability of antihypertensive drugs in Nigeria is shaped by a complex interplay of drug pricing, healthcare infrastructure, insurance coverage, and socioeconomic fac-tors. While low-cost generic drugs provide an affordable option for many patients, the cost of more advanced combination therapies remains a barrier for lower-income individuals.

Expanding health insurance coverage, improving the distribution of drugs to rural areas, and ensuring stable pricing through government intervention are critical steps needed to improve the economic availability of antihypertensive drugs in the country. Addressing these challenges is essential for ensuring that all Nigerians, regardless of income level or geographic location, have access to effective treatment for hypertension.

Hypertension is a significant public health issue in Nigeria, and while there are several programs in place to address the condition, more needs to be done to ensure widespread access to treatment. Improving healthcare infrastructure, expanding insurance coverage, and increasing public awareness are essential

steps toward better hypertension management in the country. Ad- dressing these challenges will be critical for reducing the prevalence of hypertension and its associated complications, ultimately improving the overall health of Nigeria’s population.

CONCLUSIONS

1. Hypertension is a significant public health concern characterized by a complex interplay of genetic, environmental, and lifestyle factors. This multifaceted condition poses serious health risks, including cardiovascular disease and organ damage, particularly when left unmanaged. Effective treatment and management are crucial, yet many individuals face barriers to accessing appropriate healthcare, especially in low-resource settings. These challenges can hinder timely diagnosis and treatment, increasing the likelihood of severe complications and worsening health outcomes.

2. To improve the management of hypertension, it is essential to enhance healthcare access through strengthened primary care services and health education initiatives. Innovative healthcare technologies can also play a vital role in facilitating better monitoring and treatment options. Additionally, implementing policies aimed at making healthcare more affordable and accessible can help mitigate the obstacles faced by individuals with hypertension. By addressing these multifaceted barriers, healthcare systems can significantly improve the prevention, detection, and management of hypertension, ultimately reducing its burden on both individuals and society.

3. In comparing the presence of antihypertensive drugs on national and international lists, it is evident that Nigeria includes many essential drugs that align with global standards but it is also clear that there is significant overlap in the core medications used to treat hypertension.

4. There are gaps in the availability of therapeutic alternatives and modern combination therapies, which are crucial for enhancing treatment flexibility and patient adherence. The international list offers greater flexibility, more therapeutic alternatives, and clearer guidelines for special populations. The national list, while comprehensive, provides fewer options and less de- tailed guidance, potentially limiting its utility in complex cases or for patients with specific needs.

5. To improve hypertension management at a national level, countries

could consider incorporating more of the therapeutic alternatives and guidelines present in international lists. This would enhance the flexibility of treatment and ensure that patients have access to the most effective and up-to-date therapies, ultimately improving health outcomes for individuals living with hypertension.

6. Addressing hypertension on a societal level requires tackling these root socioeconomic causes. Addressing these socioeconomic factors is crucial for effectively managing and reducing hypertension cases in Nigeria. Efforts to combat hypertension should include improving health- care accessibility, enhancing public health education, promoting healthy lifestyles, and reducing poverty through economic development programs. Without addressing the underlying socioeconomic determinants, the burden of hypertension will continue to rise, posing a serious threat to public health and the economy.

7. The economic availability of antihypertensive drugs in Nigeria is shaped by a complex interplay of drug pricing, healthcare infrastructure, insurance coverage, and socioeconomic fac- tors. While low-cost generic drugs provide an affordable option for many patients, the cost of more advanced combination therapies remains a barrier for lower-income individuals.

8. Expanding health insurance coverage, improving the distribution of drugs to rural areas, and ensuring stable pricing through government intervention are critical steps needed to improve the economic availability of antihypertensive drugs in the country. Addressing these challenges is essential for ensuring that all Nigerians, regardless of income level or geographic location, have access to effective treatment for hypertension.

REFERENCES

1. World Health Organization. Hypertension. Publication date August 25, 2021. URL: https://www.who.int/health-topics/hypertension (Date of access: 30.04.2024).

2. Harvard Heath. Reading The New Blood Pressure Guidelines. Publication date March 26, 2024. URl: https://www.health.harvard.edu/topics/heart-health/all?page=10 (Date of access: 30.04.2024).

3. Health Line. Heart Health. 2024. URL: https://www.healthline.com/health/types-and-stages-of-hypertension (Date of access: 30.04.2024).

4. Health Line. What Are the Stages and Types of Hypertension? Date of publication May 17, 2024. Types and Stages of Hypertension (High Blood Pressure). URL: https://www.medicalnewstoday.com/articles/types-of-hypertension (Date of access: 30.04.2024).

5. NHLBI. High Blood Pressure. Publication Date April 30, 2024. High Blood Pressure – Causes and Risk Factors NHLBI, NIH. URL: https://www.nhlbi.nih.gov/health/high-blood-pressure/causes (Date of access: 30.04.2024).

6. Imperial Center Family Medicine. 9 Ways Hypertension Affects Your Daily Life. Publication Date August 21, 2023. URL: https://icfamilymedicine.com/9-ways-hypertension-affects-your-daily-life/ (Date of access: 30.04.2024).

7. American Heart Association News. Publication date: september 6, 2022. URL: https://newsroom.heart.org/news/high-blood-pressure-awareness-control-improved-with-better- access-to-primary-health-care (Date of access: 30.04.2024).

8. Center for disease control and prevention. High blood pressure awareness, control improved with better access to primary health care. 2023. Sectors

and Strategies High Blood Pressure CDC. URL: https://pmc.ncbi.nlm.nih.gov/articles/PMC10651269/ (Date of access: 30.04.2024).

9. Research Gate. Hypertension and Aging. Date of publication February 2016. Prevalence of hypertension among adults by age and sex according to the Download Scientific Diagram. URL: https://www.researchgate.net/publication/292678578_Hypertension_and_Aging (Date of access: 30.04.2024).

10. Center for Disease Control. High Blood Pressure. Date of publication 2023. High Blood Pressure High Blood Pressure CDC. URL: https://www.cdc.gov/high-blood-pressure/index.html (Date of access: 30.04.2024).

11. Europe Pubmed Central. The Global Epidemiology of Hypertension. Date of publication February 5th 2020. The global epidemiology of hypertension – Abstract – Europe PMC. URL: https://pmc.ncbi.nlm.nih.gov/articles/PMC7998524 / (Date of access: 30.04.2024).

12. An estimate of the prevalence of hypertension in Nigeria: a systematic review and meta–analysis / D. Adeloye et al. *J. Hypertens.* 2015. Vol. 33 (2). P. 230–242.

13. The Burden of Cardiovascular Disease Attributable to Hypertension in Nigeria: A Modelling Study Using Summary–Level Data / A. E. Ojo et al. *Global heart*. 2024. Vol. 19 (1). P. 50.

14. Mayo Clinic. Diuretics – Mayo Clinic Cleveland Clinic. Angiotensin–Converting Enzyme (ACE) Inhibitors. URL: https://www.mayoclinic.org/diseases-conditions/high-blood-pressure/in-depth/ace-inhibitors/art-20047480 (Date of access: 30.04.2024).

15. Angiotensin receptor blockers. Date of publication October 10, 2024. URL: https://www.drugs.com/drug-class/angiotensin-ii-inhibitors.html (Date of access: 30.04.2024).

16. Calcium Channel Blockers: High Blood Pressure and Other Uses. Date of publication: December 18, 2023. URL: https://www.webmd.com/hypertension-high-blood-pressure/treatment-calcium-channel (Date of access: 30.04.2024).

17. National Health Service. Beta Blockers. Date of publication: 02 December 2022. URL: https://www.nhs.uk/conditions/beta-blockers/ (Date of access: 30.04.2024).

18. The Role of Combination Therapy in the Treatment of Hypertension. URL: https://www.tandfonline.com/doi/abs/10.1080/080370598438564 (Date of access: 30.04.2024).

19. World Health Organization. WHO Model List of Essential Medicines – 23rd list, 2023. Date of publication 26 July 2023. URL: https://www.who.int/publications/i/item/WHO-MHP-HPS-EML-2023.02 (Date of access: 30.04.2024).

20. Federal Ministry of Health and Social Welfare. Nigerian List of Essential Medicines. Date of publication January 06, 2020. Food and Drug Services Policy Documents. URL: https://www.scribd.com/document/561877851/Nigeria-Essential-Medicine-List-2020 (Date of access: 30.04.2024).

21. African Journals Online. Guidelines for the management of hypertension in Nigeria. Published May 23, 2023. Nigerian Medical Practitioner. URL: https://www.ajol.info/index.php/nmp/article/view/248113 (Date of access: 30.04.2024).

22. National Bureau of Statistics. Poverty and Inequality in Nigeria. Published 2023. Reports National Bureau of Statistics. URL: https://nigerianstat.gov.ng/elibrary (Date of access: 30.04.2024).

23. Lippincott Journal of Hypertension. Worldwide prevalence of hypertension: a systematic review. Date of publication 19th January, 2004. URL: https://journals.lww.com/jhypertension/fulltext/2004/01000/worldwide_prevalence_of_hyperten- sion a_systematic.3.aspx (Date of access: 30.04.2024).

24. Wiley Online Library. The Effects of Socioeconomic Determinants on Hypertension in a Cardiometabolic At-Risk European Country. Published: 28th august 2017. URL: https://onlinelibrary.wiley.com/doi/10.1155/2017/7107385 (Date of access: 30.04.2024).

25. BMC public health. Influence of contextual socioeconomic position on hypertension risk in low- and middle-income countries: disentangling context from composition. Published december 6, 2021. URL: https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-021-12238-x (Date of access: 30.04.2024).

26. Control of Cardio– vascular Diseases in Developing Countries. Research, Development, and Institutional Strengthening. URL: https://nap.nationalacademies.org/catalog/6218/control-of-cardiovascular-diseases-in-developing-countries-research-development-and (Date of access: 30.04.2024).

27. Imperial Center Family Medicine. How Socioeconomic Factors Influence Hypertension Risk. Published September 16, 2024. URL: https://icfamilymedicine.com/how-socioeconomic-factors-influence-hypertension-risk/ (Date of access: 30.04.2024).

28. Improving hypertension control in Nigeria: early policy implications from the Hypertension Treatment in Nigeria program. 2024. URL: https://www.researchgate.net/publication/382295713_Improving_hypertension_control_in_Nigeria_early_policy_implications_from_the_Hypertension_Treatment_in_Nigeria_program (Date of access: 30.04.2024).

30 Social determinants of hypertension in high-income countries: A narrative literature review and future directions / A. Nakagomi et al. *Hypertens Res*. 2022. Vol. 45. P. 1575–1581. DOI: 10.1038/s41440-022-00972-7.

29. The Effects of Socioeconomic Determinants on Hypertension in a Cardiometabolic At-Risk European Country / Sarah Cuschieri et al. *Int. J. Hypertens*. 2017. Vol. 7. P. 7107385. DOI: 10.1155/2017/7107385.

30. The prevalence, awareness, management and control of hypertension in men and women in Benin, West Africa: The TAHES study / I. Desormais et al. *BMC Cardiovasc Disord*. 2019. Vol. 19 (1). P. 303. DOI: 10.1186/s12872-019-01273-7.

31. Effects of socioeconomic status on the control of hypertension in patients <65 and ≥65 years of age in Taiwan: a nationwide cross-sectional study / S.

Lin et al. *BMJ Open*. 2022. Vol. 12. P. e050041. DOI: 10.1136/bmjopen-2021-050041.

32. Body composition and physical activity as mediators in the relationship between socioeconomic status and blood pressure in young South African women: A structural equation model analysis / R. J. Munthali et al. *BMJ Open*. 2018. Vol. 8 (12).P. e023404. DOI: 10.1136/bmjopen-2018-023404.

ANNEX

Annex A

12.4 ANTIHYPERTENSIVES DRUGS				
Amiloride + hydrochlorothiazide	Tablet	0.5mg/25mg	Tab.	**20.00**
Amlodipine	Tablet (Besylate)	5mg	Tab.	**20.00**
Amlodipine	Tablet (Besylate)	10mg	Tab.	**22.00**
Amlodipine + Valsartan	Tablet	5 mg + 160mg	Tab	**200.00**
Amlodipine + Valsartan (10/160mg) Tablet	Tablet	10/160mg	Tablet	**160.00**
Amlodipine + Valsartan + HCT (10/160/12.5mg) Tablet	Tablet	10mg/160mg/12.5mg	Tablet	**260.00**
Amlodipine + Valsartan + HCT (10/160/25mg) Tablet	Tablet	10mg/160mg/25mg	Tablet	**320.00**
Amlodipine + Valsartan + Hydrochlorothiazide	Tablet	5 mg + 160mg + 12.5mg	Tab	**360.00**
Atenolol	Tablet	25mg	Tab.	**16.00**
Atenolol	Tablet	50 mg	Tab.	**18.00**
Atenolol	Tablet	100mg	Tab.	**30.00**
Candesartan cilexetil	Tab	8mg		**64.00**
Candesartan cilexetil	Tab	16mg		**75.00**
Candesartan cilexetil/hydrochlothiazide	Tab	16/12.5mg		**138.00**
Captopril	Tablet	12.5 mg,	Tab.	**15.00**

NAME OF MEDICINES	DOSAGE FORM	STRENGTHS	PRESENTATION	PRICE
Captopril	Tablet	25 mg	Tab.	**20.00**
Captopril	Tablet	50mg	Tab	**57.07**
Carvedilol 12.5mg tab	Tablet	12.5mg	Tablet	**26.00**
Carvedilol 25mg Tablet	Tablet	25mg	Tablet	**54.00**
Carvedilol 3.125mg tab	Tablet	3.125mg	Tablet	**21.00**
Carvedilol 6.25mg tab	Tablet	6.25mg	Tablet	**30.00**
Doxazocin 2mg Tablet	Tablet	2mg	Tablet	**21.00**
Doxazocin 4mg Tablet	Tablet	4mg	Tablet	**36.00**
Enalapril	Tablet	5mg	Tab.	**30.00**
Enalapril	Tablet	10mg	Tab.	**35.00**
Felodipine	Tablet	5mg	Tab.	**80.00**
Felodipine	Tablet	10mg	Tab.	**100.00**
Hydralazine	Tablet	25mg,	Tab.	**15.00**
Hydralazine	Tablet	50mg	Tab	**25.00**
Hydralazine	Injection powder	20mg in 1ml Ampoule	Amp.	**170.00**
Indapamide 1.5mg tab	Tab	1.5mg	Tab	**117.00**
Irbesartan	Tablet	300mg	Tablet	**143.00**
Irbesartan + Amlodipine	Tablet	300mg+10mg	Tablet	**177.00**
Irbesartan + Amlodipine	Tablet	300mg+5mg	Tablet	**166.00**
Irbesartan/Amlodipine(150/10mg) tab	Tablet	150mg/10mg	Tablet	**175.00**
Irbesartan/amlodipine(150/5mg) tab	Tablet	150mg/5mg	Tablet	**167.00**
Irbesartan 150mg Tablet	Tablet	150mg	Tablet	**171.00**
Isradipine	Tablet	2.5mg	Tab.	**151.67**
Isradipine	Tablet	5mg	Tab.	**143.33**
Labetalol	Tablet (HCL)	200mg	Tab.	**82.00**
Labetalol	Injection powder Tablet (HCL)	5mg/ml in 20ml Ampoule	Amp.	**200.00**
Lacidipine	Tablet	2mg	Tab.	**300.00**
Lisinopril	Tablet	2.5mg	Tab.	**20.00**
Lisinopril	Tablet	5mg	Tab.	**25.00**
Lisinopril	Tablet	10mg	Tab.	**32.00**
Lisinopril + hydrochlorothiazide	Tablet	20mg/12.5mg	Tab.	**55.00**

Continuation Annex A

NAME OF MEDICINES	DOSAGE FORM	STRENGTHS	PRESENTATION	PRICE
Losartan + Amlodipine	Tablet	50mg/5mg	Tablet	122.00
Losartan 25mg Tablet	Tablet	25mg	Tablet	60.00
Losartan 50mg Tablet	Tablet	50mg	Tablet	60.00
Methyldopa	Tablet	500mg	Tab.	50.16
Metoprolol 25mg Tablet	Tablet	25mg	Tablet	121.00
Metoprolol 50mg Tablet	Tablet	50mg	Tablet	73.00
Metoprolol Succinate 100mg tab	Tablet	100mg	Tablet	97.00
Metoprolol Succinate 25mg tab	Tablet	25mg	Tablet	23.00
Metoprolol Succinate 50mg tab	Tablet	50mg	Tablet	28.00
Metoprolol Tartrate 50mg tab	Tablet	50mg	Tablet	60.00
Nebivolol	Tablet	5mg	Tablet	70.00
Nebivolol + Hydrochlorothiazide	Tablet	5mg /12.5mg	Tablet	100.00
Nifedipine	Tablet,	20mg	Tab.	33.00
Nifedipine	slow release	30mg	Tab.	50.00
Olmesartan	Tablet	20mg,40mg	Tablet	180.00
perindopril	Tablet	10mg	Tablet	233.00
Perindopril	Tablet	5mg	Tablet	175.00
Perindopril + Indapamide	Tablet	10/2.5mg	Tablet	220.00
Perindopril + Indapamide	Tablet	5/1.25mg	Tablet	152.00
Perindopril arginine + Amlodipine	Tablet	10mg/10mg	Tablet	233.00
Perindopril arginine + Amlodipine	Tablet	10mg/5mg	Tablet	242.00
Perindopril arginine + Amlodipine	Tablet	5mg/5mg	Tablet	240.00
Perindopril arginine + Amlodipine	Tablet	5mg/10mg	Tablet	242.00
Prazosin	Tablet	1mg	Tab.	20.00
Prazosin	Tablet	2mg	Tab.	25.00
Prazosin + Polythiazide	Tablet	0.5mg + 0.25mg (respectively)	Tab.	40.00
Propranolol (Hydrochloride)	Tablet	40mg	Tab	40.00
Ramipril +hydrochlorothiazide	Tablet	5mg/25mg	Tablet	23.00
Ramipril 10mg Tablet	Tablet	10mg	Tablet	22.00
Ramipril 5mg Tablet	Tablet	5mg	Tablet	50.00
Reserpine + Dihydroergocristine + Clopamide (Restricted)	Tablet	Reserpine 0.1mg + Dihydroergocristine 0.5mg + Clopamide 5.0mg	Tab.	40.00

NAME OF MEDICINES	DOSAGE FORM	STRENGTHS	PRESENTATION	PRICE
Resperpine + Dihydroergocristine + Hydrochlorothiazide (Restricted)	Tablet	Resperpine 0.1mg+ Dihydroergocristine 0.6mg+ HCT	Tab.	40.00
Resperpine + Dihydroergocristine +Hydrochlorothiazide (Restricted)	Tablet	Hydrochlorothiazide 10mg	Tab.	40.00
S-Amlodipine 5mg Tablet	Tablet	5mg	Tablet	88.00
Telmisartan	Tablet	Telmisartan 40mg	Tab	80.00
Telmisartan	Tablet	Telmisartan 80mg	Tab	90.00
Telmisartan + Hydrochlorthiazide	Tablet	Telmisartan 40mg/HCTZ 12.5mg	Tab	95.00
Telmisartan + Hydrochlorthiazide	Tablet	Telmisartan 80mg/HCTZ 12.5mg	Tab	123.00
Valsatan	Tab	80mg	Tab	95.00
Valsatan	Tab	160mg	Tab	83.00
Valsatan /Hydrochlothiazide	Tab	80/12.5mg	Tab	108.00
Valsatan /Hydrochlothiazide	Tab	160/12.5mg	Tab	136.00
Valsatan /Hydrochlothiazide	Tab	160/25mg	Tab	136.00

National University of Pharmacy

Faculty for foreign citizens' education
Department of social pharmacy

Level of higher education master

Specialty 226 Pharmacy, industrial pharmacy
Educational program Pharmacy

APPROVED
The Head of Department
of Social Pharmacy

_____
Alina VOLKOVA
"15" of April 2024

ASSIGNMENT
FOR QUALIFICATION WORK
OF AN APPLICANT FOR HIGHER EDUCATION

Thelma Godfrei AKPAMA

1. Topic of qualification work: «Study on the influence of socioeconomic factors on hypertension prevalence»,
supervisor of qualification work: Iryna SURIKOVA, PhD, associated professor,
approved by order of NUPh from "6th" of February 2024 № 34

2. Deadline for submission of qualification work by the applicant for higher education: October 2024.

3. Outgoing data for qualification work: data from scientific and periodical literature in accordance with research objectives; reports of international organizations, statistical data, WHO Model list of essential medicines, Nigerian national list of essential medicines, price-lists of essential medicines in Nigeria.

4. Contents of the settlement and explanatory note (list of questions that need to be developed):
- to conduct a review of literary sources on social burden of hypertension issues;
- to study of hypertension as a public health problem and social burden of tuberculosis;
- to analyze the prevalence of hypertension in the world and Nigeria;
- to study of drug therapy treatment of hypertension in accordance with international guidelines
- to analyze WHO essential medicine list and Nigerians essential medicine list Essential Medicines for Hypertension;
- to compare of Nigerian hypertension guidelines with Global Standard
- to research on affordability of hypertension drugs in Nigeria;
- to analyze of factors influencing the economic availability of hypertensive drugs in Nigeria..

5. List of graphic material (with exact indication of the required drawings):
Figures – 5, Tables – 3

6. Consultants of chapters of qualification work

Chapters	Name, SURNAME, position of consultant	Signature, date	
		assignment was issued	assignment was received
1	Iryna SURIKOVA, associated professor of higher education institution of department Social Pharmacy	19.04.2024	19.04.2024
2	Iryna SURIKOVA, associated professor of higher education institution of department Social Pharmacy	15.05.2024	15.05.2023
3	Iryna SURIKOVA, associated professor of higher education institution of department Social Pharmacy	17.06.2024	17.06.2024

7. Date of issue of the assignment: «15» of April 2024.

CALENDAR PLAN

№	Name of stages of qualification work	Deadline for the stages of qualification work	Notes
1	Analysis of scientific, periodic literature on the topic of qualification work	April 2024	**done**
2	Study of the prevalence of hypertension worldwide and modern approaches to pharmacotherapy	May – June 2024	**done**
3	Analysis of cost for hypertension treatment and prevention	September 2024	**done**
4	Research on the availability of hypertension treatment	September 2024	**done**
5	Summary of the results of the study	October 2024	**done**
6	Finalizing the work, preparing the report	October 2024	**done**

An applicant of higher education Thelma Godfrei AKPAMA

Supervisor of qualification work Iryna SURIKOVA

ВИТЯГ З НАКАЗУ № 34
По Національному фармацевтичному університету
від 06 лютого 2024 року

1. Затвердити теми кваліфікаційних робіт здобувачам вищої освіти 5-го курсу 2 циклу Фм20*(4,10д) 2024-2025 навчального року, ступінь вищої освіти «магістр», галузь знань 22 Охорона здоров'я, спеціальність 226 – Фармація, промислова фармація, освітньо-професійна програма – Фармація, денна форма здобуття освіти (термін навчання 4 роки 10 місяців). Мова навчання англійська

№ з/п	Прізвище, ім'я здобувача вищої освіти	Тема кваліфікаційної роботи		Посада, прізвище та ініціали керівника	Рецензент кваліфікаційної роботи
• **по кафедрі соціальної фармації**					
15.	Акпама Тельма Годфрей	Дослідження впливу соціаль-но-економічних факторів на поширеність гіпертонічної хвороби	Study on the influence of socioeconomic factors on hypertension prevalence	доцент Сурікова І.О.	доцент Бондарєва І. В.

Ректор

Вірно. Секретар

ВИСНОВОК

експертної комісії про проведену експертизу
щодо академічного плагіату у кваліфікаційній роботі

здобувача вищої освіти

«21» листопада 2024 р. № 329638263

Проаналізувавши кваліфікаційну роботу здобувача вищої освіти Акпама Тельма Годфрей, Фм20*(4,10д)-англ-02, спеціальності 226 Фармація, промислова фармація, освітньої програми «Фармація» навчання на тему: «Дослідження впливу соціально-економічних факторів на поширеність гіпертонічної хвороби / Study on the influence of socioeconomic factors on hypertension prevalence», експертна комісія дійшла висновку, що робота, представлена до Екзаменаційної комісії для захисту, виконана самостійно і не містить елементів академічного плагіату (компіляції).

Голова комісії,
проректор ЗВО з НПР,
професор **Інна ВЛАДИМИРОВА**

REVIEW

of scientific supervisor for the qualification work of the master's level of higher education of the specialty 226 Pharmacy, industrial pharmacy

Thelma Godfrei AKPAMA

on the topic: «STUDY ON THE INFLUENCE OF SOCIOECONOMIC FACTORS ON HYPERTENSION PREVALENCE»

Relevance of the topic. Hypertension affects millions of individuals globally and is often termed a "silent killer" due to its asymptomatic nature. By exploring the socioeconomic determinants of hypertension, this study can help identify at-risk populations and inform public health initiatives aimed at reducing the burden of this condition. Recognizing the disparities in hypertension prevalence across different socioeconomic groups can guide resource allocation and targeted health programs.

Practical value of conclusions, recommendations and their validity. The results of the research can be used as the basis for a set of measures to improve approaches to providing pharmaceutical care to patients with hypertension taking into account socio-economic determinants in Nigeria.

Assessment of work. During the research the student showed a creative approach to the solution of the tasks, diligently conducted research work, summarized and presented the results properly, which indicates the awareness of the problem and the proper level of its development. The work is carried out at a sufficient scientific level.

General conclusion and recommendations on admission to defend. In general, the qualification work of Thelma Godfrei AKPAMA on the topic « Study on the influence of socioeconomic factors on hypertension prevalence» is performed at the proper level, meets the requirements of the "Regulations on the preparation and protection of qualification works at the National University of Pharmacy" and can be recommended for defense in the Examination commission.

Scientific supervisor Iryna SURIKOVA

«7th» of November 2024

Ф А 2.2.1-32-356

REVIEW

for qualification work of the master's level of higher education, specialty 226 Pharmacy, industrial pharmacy

Thelma Godfrei AKPAMA

on the topic: «STUDY ON THE INFLUENCE OF SOCIOECONOMIC FACTORS ON HYPERTENSION PREVALENCE

Relevance of the topic. Socioeconomic factors play a crucial role in health equity. Individuals from lower socioeconomic backgrounds often face barriers to accessing healthcare, healthy food, and resources for physical activity, all of which contribute to higher rates of hypertension. The relevance of studying the influence of socioeconomic factors on hypertension prevalence cannot be overstated. It not only enhances our understanding of the disease but also drives efforts toward equitable healthcare solutions, effective policy-making, and targeted interventions that can ultimately improve public health outcomes for all populations.

Theoretical level of work. The qualification work was carried out based on the study of scientific literary sources, processing and analysis of data on the stated topic. It should be noted that the work is presented logically, scientific and methodological developments and the results do not raise doubts about their validity and reliability. The selected methods and scope of research meet the goals and main objectives. The applicant conducted an analysis of publications by domestic and foreign authors on the subject under study. The generalized results of this analysis are systematized and reflected in the work.

Author's suggestions on the research topic. A comprehensive study was conducted to assess the socio-economic factors that influence the prevalence of hypertension. This study included a systematic review and synthesis of literature and statistical data, as well as a study of the legal framework governing the provision of pharmaceutical care to patients with hypertension, a comparison of hypertension treatment guidelines and the availability of antihypertensive drugs in Nigeria, and the influence of social factors

on the availability of antihypertensive pharmacotherapy. This study provided insights into the challenges and opportunities for optimizing pharmaceutical care for individuals with hypertension.

Practical value of conclusions, recommendations and their validity. Acquaintance with the qualification work gives reasons to affirm the expediency of the conducted research and the practical value of the recommendations.

Disadvantages of work. Minor typos and grammatical errors are present in the text.

General conclusion and assessment of the work. According to the relevance and the results of the research qualification work of Thelma Godfrei AKPAMA on the topic «Study on the influence of socioeconomic factors on hypertension prevalence» meets the requirements for master's works and can be recommended for official defense in the Examination commission.

Reviewer Associate professor Iryna BONDARIEVA

«8th» of November 2024

ВИТЯГ
з протоколу засідання кафедри соціальної фармації
№ 5 від «08» листопада 2024 року

ПРИСУТНІ: зав. каф. доц. Аліна ВОЛКОВА, проф. Ганна ПАНФІЛОВА, проф. Вікторія НАЗАРКІНА, доц. Галина БОЛДАРЬ, доц. Наталія ГАВРИШ, доц. Тетяна ДЯДЮН, доц. Юлія КОРЖ, асист. Альміра НОЗДРІНА, доц. Вікторія МІЩЕНКО, доц. Ірина ПОПОВА, доц. Олександр СЕВРЮКОВ, доц. Ірина СУРІКОВА, доц. Любов ТЕРЕЩЕНКО, доц. Наталія ТЕТЕРИЧ.

ПОРЯДОК ДЕННИЙ:

Про представлення до захисту в Екзаменаційній комісії кваліфікаційних робіт.

СЛУХАЛИ: завідувачку кафедри доц. Аліну ВОЛКОВУ з рекомендацією представити до захисту в Екзаменаційній комісії кваліфікаційну роботу здобувача вищої освіти спеціальності 226 Фармація, промислова фармація Акпами Тельми Годфрей на тему: «Дослідження впливу соціально-економічних факторів на поширеність гіпертонічної хвороби».

Науковий керівник к. фарм. н., доцент кафедри СФ Ірина СУРІКОВА.

Рецензент к. фарм. н., доцент кафедри ММЗЯФ Ірина БОНДАРЄВА.

УХВАЛИЛИ: Рекомендувати до захисту в Екзаменаційній комісії кваліфікаційну роботу здобувача вищої освіти Акпами Тельми Годфрей на тему: «Дослідження впливу соціально-економічних факторів на поширеність гіпертонічної хвороби».

Завідувачка каф. СФ, доцент Аліна ВОЛКОВА

Секретар, доцент Наталія ТЕТЕРИЧ

Ф А2.2.1-32-042

НАЦІОНАЛЬНИЙ ФАРМАЦЕВТИЧНИЙ УНІВЕРСИТЕТ

ПОДАННЯ
ГОЛОВІ ЕКЗАМЕНАЦІЙНОЇ КОМІСІЇ
ЩОДО ЗАХИСТУ КВАЛІФІКАЦІЙНОЇ РОБОТИ

Направляється здобувач вищої освіти Тельма Годфрей АКПАМА до захисту кваліфікаційної роботи
за галуззю знань 22 Охорона здоров'я
спеціальністю 226 Фармація, промислова фармація
освітньою програмою Фармація
на тему: «Дослідження впливу соціально-економічних факторів на поширеність гіпертонічної хвороби».

Кваліфікаційна робота і рецензія додаються.

Декан факультету _____ / Світлана КАЛАЙЧЕВА /

Висновок керівника кваліфікаційної роботи

Здобувач вищої освіти Тельма Годфрей АКПАМА під час виконання кваліфікаційної роботи продемонструвала уміння працювати з науковими даними, проводити їх узагальнення, аналізувати та узагальнювати результати дослідження. Усі поставлені завдання відповідно до мети роботи було виконано у повному обсязі. Результати дослідження належним чином оброблені і представлені.

Таким чином, кваліфікаційна робота може бути рекомендована до офіційного захисту в Екзаменаційній комісії Національного фармацевтичного університету.

Керівник кваліфікаційної роботи Ірина СУРІКОВА

«07» листопада 2024 р.

Висновок кафедри про кваліфікаційну роботу

Кваліфікаційну роботу розглянуто. Здобувач вищої освіти Тельма Годфрей АКПАМА допускається до захисту даної кваліфікаційної роботи в Екзаменаційній комісії.

Завідувачка кафедри
соціальної фармації Аліна ВОЛКОВА

«08» листопада 2024 р.

Qualification work was defended

of Examination commission on

« 28 » November 2024

With the grade _____

Head of the State Examination commission,

DPharmSc, Professor

_____ / Oleh SHPYCHAK /