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Conscientious Efforts in Lifestyle and Diet Modifications: The Roadmap to Silence the Silent Killer

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Abstract:

Hypertension is a major global public health problem and one of the leading causes of premature death worldwide. Africa has one of the highest prevalence rates of hypertension, with only a small proportion of affected individuals achieving adequate blood pressure control. In Nigeria, hypertension contributes significantly to cardiovascular diseases, emergency hospital admissions, and mortality. The condition is often referred to as the "silent killer" because it usually presents without obvious symptoms until severe complications occur. This paper critically examined hypertension, its risk factors, complications, and the role of lifestyle and dietary modifications in its prevention and control. The review highlighted the importance of regular physical exercise, weight management, stress reduction, adequate sleep, smoking cessation, and healthy dietary practices in reducing blood pressure and preventing complications. Dietary approaches such as sodium restriction, increased potassium intake, DASH diet, and Mediterranean diet were identified as effective strategies for blood pressure control and cardiovascular protection. The review further emphasized the need for increased public awareness and adoption of healthy lifestyle practices to reduce the growing burden of hypertension and improve quality of life.

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Introduction

An estimated 1.28 billion people worldwide have hypertension (World Health Organization, 2023) and a projected figure of 1.5 billion is expected by 2025 (Nawi et al, 2021). Fewer than 1 in 5 people have well-controlled hypertension (World Health Organization, 2023) and more than 9 million deaths are associated with hypertension (Nawi, 2021).

Hypertension is the leading cause of premature deaths in Africa (Yuyun et al, 2020). Its prevalence of up to 54% in adults in Africa (Sharma, et al, 2021). More disturbingly, only 7% of individuals with hypertension have their blood pressure controlled, with 93% of individuals at high risk of complications, including stroke, myocardial infarction, heart failure, kidney disease, and blindness (Parati, et al, 2022). The condition is often referred to as the "silent killer" because it usually presents without obvious symptoms until severe complications occur (Parati, et al, 2022).

In Nigeria, hypertension is the most frequently diagnosed cardiovascular risk equivalent, with hypertension-related complications accounting for approximately a quarter of emergency admissions in urban hospitals (Adeloye et al, 2021). The Nigerian population's mean blood pressure is higher than that of people in Europe and the United States (Adeloye et al, 2021). They further asserted that one in four adult Nigerians is hypertensive and that hypertension unawareness is a likely contributor to deaths from cardiovascular disease in the country.

Hypertension is diagnosed if, when it is measured on two different days, the systolic blood pressure reading on both days is≥140mmHg and/or the diastolic blood pressure reading on both days is≥90 mmHg (WHO, 2023). According to the International Society of Hypertension, blood pressure (BP) is classified into four categories: normal (<130/85mmHg), high-normal (130-139/85-89mmHg), grade 1 hypertension (140-159/90-99mmHg), and grade 2 hypertension (≥160/100mmHg) (Unger, Borghi and Charchar, 2020).

Risk Factors of Hypertension

The risk factors for developing hypertension are divided into modifiable and non-modifiable risk factors.

a) Non-modifiable Risk Factors

- Age: The likelihood of developing hypertension rises as people grow older. Men are more commonly affected before the age of 64, while women have a higher tendency to develop hypertension after 65.
- Race: Hypertension occurs more frequently among Black individuals and often develops earlier compared to White populations.
- Family history: Individuals with a parent or sibling who has hypertension are at greater risk of developing the condition themselves (WHO, 2023).

b) Modifiable Risk Factors

- Overweight and Obesity: Excess body weight can alter the function of blood vessels, kidneys, and other organs, contributing to elevated blood pressure. Obesity can also increase the likelihood of other cardiovascular risk factors, including high cholesterol levels.
- Physical inactivity: A sedentary lifestyle may lead to weight gain, which in turn increases the risk of hypertension. People who do not engage in regular exercise are more prone to developing high blood pressure.
- Tobacco use: Smoking, chewing tobacco or vaping can temporarily raise blood pressure and damage blood vessel walls, accelerating the hardening of the arteries.

• High salt intake: Consuming too much salt promotes fluid retention in the body, which can result in increased blood pressure.
• Low potassium intake: Potassium is essential for maintaining balance of sodium in body cells and supporting cardiovascular health. Insufficient potassium intake or conditions such as dehydration may contribute to dehydration.
• Excess alcohol consumption: Frequent or heavy alcohol intake has been associated with elevated blood pressure, especially among men.
• Psychosocial stress: Severe or prolonged stress can lead to a temporary increase in blood pressure. Stress-related behaviors such as overeating, smoking or alcohol use can further worsen hypertension risk (WHO, 2023).

Most times hypertension shows no obvious sign and symptoms; hence, the name 'silent killer' is given to it. It is a silent killer as very rarely any symptom can be seen in its early stages until a severe medical crisis takes place like heart attack, stroke, or chronic kidney disease (American Heart Association, 2024). However, there are certain clinical manifestations that occur with hypertension. They include: severe headaches, chest pain, dizziness, difficulty breathing, nausea, vomiting, blurred vision or other vision changes, anxiety, confusion, buzzing in the ears, nosebleeds and abnormal heart rhythm (World Health Organization, 2023).

Complications of Hypertension

Persistent high blood pressure places excessive force on artery walls, which can damage blood vessels and vital organs over time. The severity of complications often depends on how high the blood pressure is and how long it remains uncontrolled. Some major complications include:

• Heart attack and stroke: Hypertension can contribute to the narrowing and hardening of arteries, increasing the risk of heart attack, stroke, and other cardiovascular conditions.
• Aneurysm: Conditions pressure within blood vessels may weaken their walls, causing them to bulge and form an aneurysm. If the aneurysm bursts, it can become a life-threatening emergency.
• Heart failure: High blood pressure forces the heart to pump harder than normal. Over time, this extra workload causes thickening of the heart muscles, particularly the left ventricle, which may eventually lead to heart failure when the heart can no longer pump blood effectively.
• Kidney Damage: Hypertension can injure or narrow the blood vessels supplying the kidneys, reducing kidney function and potentially resulting in kidney disease.
• Eye complications: Elevated blood pressure may damage the blood vessels in the eyes by causing them to narrow, thicken or rupture, which can impair vision or lead to blindness.
• Metabolic syndrome: Hypertension is associated metabolic syndrome, a cluster of conditions including abdominal obesity, elevated triglycerides, low levels of high-density lipoprotein (HDL) cholesterol, increased blood sugar, and impaired glucose metabolism. These conditions raise the risk of diabetes, heart disease, and stroke.
• Dementia: Reduced blood flow to the brain caused by narrowed or blocked arteries may contribute to vascular dementia. Stroke resulting from interrupted cerebral blood flow can also increase the likelihood of dementia (American Heart Association, 2024b).

Role of Lifestyle Modification in Silencing the Silent Killer

• Physical exercise

Guidelines from the Seventh and Eight US Joint National Committee, AHA, American College of Sports Medicine and Canadian Hypertension Education Program recommend increasing the levels of regular physical activity and exercise to prevent and manage hypertension (Mackenzie, 2024).

Different types of exercise such as endurance exercise (also known as aerobic exercise) like jogging, swimming, dancing etc. and resistance exercise (also 7 known as strength exercise) like push-ups, squats help to reduce blood pressure in hypertensive patients as well as preventing its occurrence in normotensive patient (National Institute on Aging, 2021). However, studies have not shown if there is a correlation between the intensity of exercise and its benefit in preventing hypertension as both moderately- intense and high-intense exercise have the same benefit.

- Body weight management

Overweight and obesity are associated with an increased risk of hypertension (Obesity Medicine Association, 2025). A cross-sectional study of 9305 adults aged ≥18 years in Bangladesh found that overweight predisposes one to hypertension (Hossain et al, 2021). Body weight-reducing strategies, particularly energy-restricted diets and physical exercise, have traditionally been considered major lifestyle interventions for the prevention and management of hypertension (Charchar et al, 2023).

- Psychosocial stress management

A growing number of people in western countries are experiencing increased anxiety, depression and chronic psychosocial stress (herein mostly referred to as 'stress' for simplicity) brought about by globalization, cultural and socioeconomic changes, and stress in the work place. Strong evidence indicates that stress and/or anxiety can transiently increase BP, being a prominent component of white-coat syndrome. Whether chronic exposure to psychosocial stress can lead to an increased risk of hypertension is more controversial (Mann, 2020). A meta-analysis showed that psychosocial stress is associated with an increased risk of hypertension and that patients with hypertension have a higher incidence of psychosocial stress than individuals without hypertension (Marwaha, 2022).

- Circadian synchrony

Circadian rhythmicity is especially relevant to the cardiovascular system. Therefore, BP, cardiac output and heart rate have a marked circadian pattern, and the dysregulation of this circadian pattern, especially for BP, is associated with increased risk of CVD. BP decreases by an average of 10–20% during sleep (Casagrande, et al, 2020), which means that lesser hour of sleep results in an increase in the risk of hypertension. However, today, short sleep durations and sleep disruptions are common throughout the year. These alterations in sleep patterns can contribute to sleep-maintenance insomnia and disrupt circadian rhythmicity and autonomic balance. Even if individuals with insomnia can achieve adequate sleep durations by compensating for nocturnal awakenings by sleeping during the day, chronic insomnia has been found to be associated with a higher night-time SBP and blunted day-to-night decreases in SBP. The observed association between sleep duration and hypertension has raised the hypothesis that interventions aimed at extending sleep duration and improving sleep quality could be effective measures for the prevention of hypertension (Casagrande et al, 2020).

- Smoking cessation

Cigarette smoking increases the risk of CVD through several mechanisms, including oxidative stress, impairment of endothelial function, arterial stiffness and inflammation, among others.

Cigarette smoking also has an acute hypertensive effect, principally through sympathetic nervous stimulation (Gallucci et al., 2020). However, no clear evidence exists for a direct causal relationship between cigarette smoking and the risk of hypertension (Gallucci et. Al, 2020).

Role of Dietary Modification in Silencing the Silent Killer

- Sodium and Potassium intake

Sodium restriction has been the most popular recommendation for the dietary prevention of hypertension and for BP reduction in general, and current dietary guidelines recommend reducing sodium (or salt) intake (Feng et al, 2020). The ACC/AHA guidelines also recommend increasing potassium intake (Feng et al, 2020). Potassium is an essential nutrient that is required for the maintenance of total body fluid volume, acid and electrolyte balance, and normal cell function. In pre-industrial era diets, potassium intake was very high, often exceeding 200mmol per day (Feng et al, 2020). However, in westernized societies, potassium intake is markedly lower. Food processing reduces the potassium content of food, and a diet high in processed foods and low in fresh fruits and vegetables is often lacking in potassium (Feng et al., 2020).

Dietary approaches to preventing hypertension or lowering high blood pressure include:

- DASH diet
- Mediterranean diet

DASH Diet

DASH is an acronym for Dietary Approach to Stop Hypertension. The DASH diet is a nutritionally based approach to prevent and control hypertension. DASH encourages the intake of vegetables and fruits, lean meat and dairy products, and the inclusion of micronutrients in the menu (Daley & Vadakekut, 2025). It also advocates the reduction of sodium in the diet to about 1500 mg/day (Challa et al, 2023). DASH emphasizes on consumption of minimally processed and fresh food. DASH diet 10 has many similarities to some of the other dietary patterns which are promoted for cardiovascular health. A standard dietary serving for individuals following the DASH diet is as follows:

- Vegetables: about five servings per day
- Fruits: about five meals per day
- Carbohydrates: about seven servings per day
- Low-fat dairy products: approximately two servings per day
- Lean meat products: about two servings or less per day
- Nuts and seeds: 2 to 3 times per week

Healthy carbohydrates included under DASH include:

- Whole grains: cracked wheat, millets, oats
- Low glycemic index fruits
- Legumes and beans

Good fats prevent inflammation, supply essential fatty acids, and promote overall wellbeing. When taken in appropriate amounts, they can increase HDL and lower small dense LDL particles (Baum, et al., 2012). Some of the sources of good fats also included in DASH include: Olive oil, avocados, nuts, hempseeds, flax seeds and fish rich in omega-3 fatty acids

Unhealthy fats, such as margarine, vegetable shortenings, partially hydrogenated vegetable oils, can increase the concentration of small LDL particles, thereby promoting atherosclerosis (Baum et al., 2012).

The DASH diet recommends more intake of plant proteins like legumes, soy products, nuts, and seeds (Daley & Vadakekut, 2025). Animal protein in the diet should mainly compose of lean meats, low-fat dairy, eggs, and fish. Processed and cured meats are not recommended as they have shown to cause hypertension and also contain carcinogens.

DASH diet also talks about the inclusion of certain foods rich in potassium, calcium, and magnesium as these prevent endothelial dysfunction and promote endothelial, smooth muscle relaxation. Some of the foods rich in potassium include bananas, oranges, and spinach. Calcium is abundantly found in dairy products and green leafy vegetables. Magnesium is present in a variety of whole 11 grains, leafy vegetables, nuts, and seeds (Challa et al, 2023).

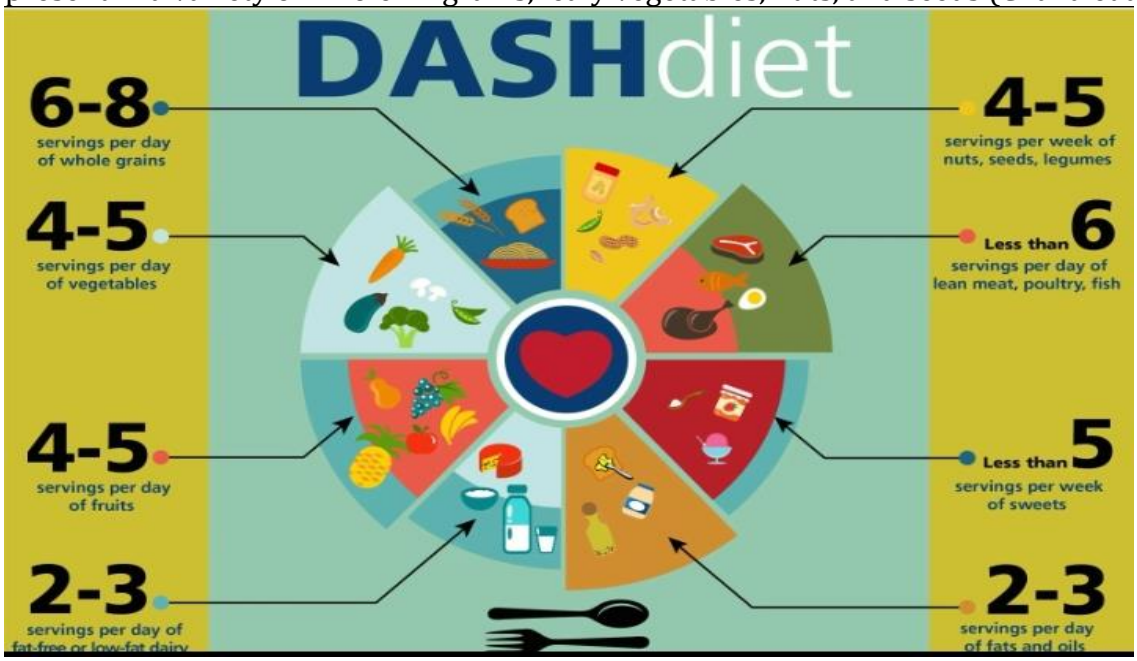


Fig 1.0: Pictorial representation of the DASH diet (Ref: Google Images)

Mediterranean Diet

Evidence has been accumulating that a Mediterranean dietary pattern may provide a substantial benefit against risk of CVD (Sacks, Sveticey, Volmer, Appel and Bray, 2020). The Mediterranean diet (MedDiet) is primarily characterized by a high intake of vegetables, fresh fruits, fish and seafood, legumes, nuts, extra-virgin olive oil and red wine. The diet is low in discretionary foods and red meat and moderate in dairy products, which include mostly cheese and yogurt (Schwingshackl, Morze, & Hoffmann, 2020). Similar dietary patterns have been associated with lower risk of CVD in other parts of the world (Sacks, Sveticey, Volmer, Appel and Bray, 2020). The Mediterranean Diet may mediate its effects in part through the maintenance of BP and endothelial function (Perez-Lopez, Fernandes-Alonso, Chedraui and Simoncini, 2022). The consumption of a diet that is high in fruit, vegetables, nuts, and unsaturated oils and low in sodium can lower BP (Sacks et al., 2020).

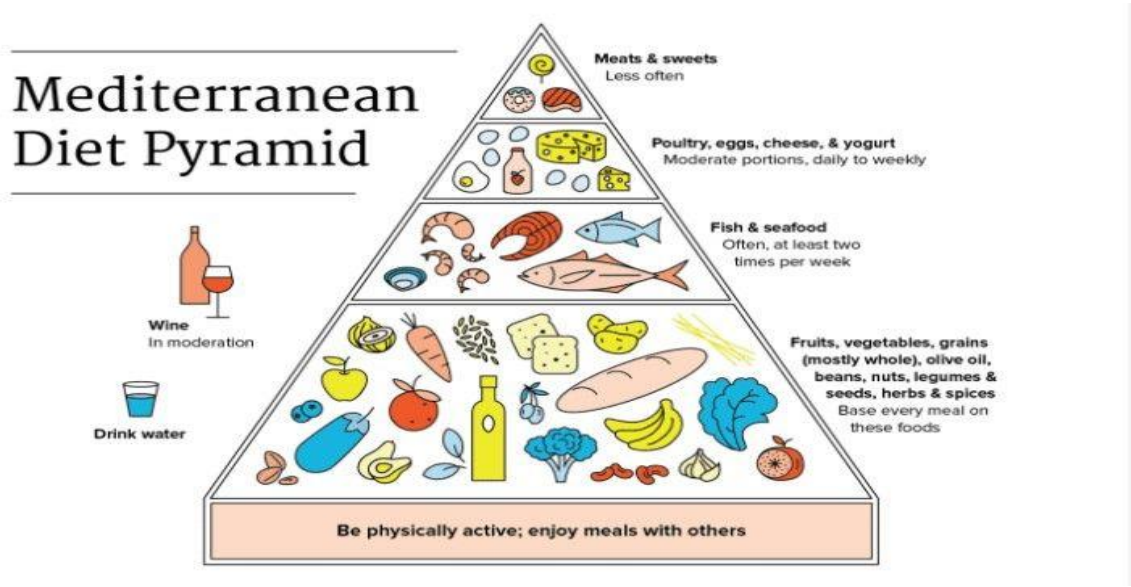


Fig 1.1: Pictorial representation of Mediterranean diet (Ref: Google Images)

Implications for Nursing Practice

The findings from this review have important implications for nursing practice, particularly in the prevention and management of hypertension. Nurses are in a strategic position to promote early detection through routine blood pressure screening and risk assessment in both hospital and community settings. They also play a key role in patient education by providing clear, culturally appropriate information on lifestyle modification, including physical activity, weight control, stress management, and smoking cessation.

In addition, nurses should actively encourage adherence to dietary recommendations such as sodium reduction, increased intake of fruits and vegetables, and adoption of the DASH and Mediterranean dietary patterns. Health education ought to be tailored to each individual patient to enhance their understanding and promote better adherence to recommendations. Nurses also have a responsibility to support behavioral change through counseling, follow-up, and motivational strategies that empower patients to adopt and sustain healthy lifestyles.

Furthermore, nurses should collaborate with other healthcare professionals in developing community-based interventions aimed at reducing the burden of hypertension. Strengthening public health awareness campaigns and integrating lifestyle education into routine nursing care can significantly contribute to the prevention of hypertension and its complications.

Conclusion

Hypertension continues to pose a significant global and national public health challenge, contributing substantially to illness and death through its complications. Despite its silent and often asymptomatic nature, it is largely preventable and manageable through appropriate lifestyle and dietary modifications. Evidence from this review highlights that regular physical activity, healthy body weight maintenance, stress control, adequate sleep, smoking cessation, and adherence to dietary approaches such as sodium restriction, DASH diet, and Mediterranean diet are effective strategies in preventing and controlling hypertension.

The increasing prevalence of hypertension, especially in developing countries such as Nigeria, highlights the importance of continuous public health education and active nursing roles in prevention, early identification, and management of the condition. Strengthening lifestyle-

focused interventions at both individual and community levels is essential in reducing the prevalence and complications of hypertension. Ultimately, consistent adoption of healthy lifestyle and dietary practices remains a key strategy in controlling the "silent killer" and improving overall cardiovascular health outcomes.

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