

Cost and sources of financing treatment of hypertension in patients attending a tertiary health care centre in a developing country: a cross-sectional review

Ogundele SO^{1,3}, Ajibare AO^{2,3}, Amisu M^{2,3}, Dada AO^{2,3}

¹Department of Pharmacology, Therapeutics and Toxicology, Lagos State University College of Medicine, Ikeja

²Department of Medicine, Lagos State University College of Medicine, Ikeja

³Department of Medicine, Lagos State University Teaching Hospital, Ikeja

*Corresponding Author: **Ogundele SO**

Abstract

Background

Hypertension is a chronic medical disorder of global importance, with increasing prevalence and economic burden. The monetary cost of treating hypertension could cause a serious economic hardship for patients, their households, and the community. Understanding the cost of treatment of hypertension, source of funding for the treatment and the payment mechanism is important for the development of effective healthcare policy and intervention.

Methodology

The study design was a cross-sectional review of patients' financing of their hypertension care using a structured questionnaire to obtain relevant information from participants attending hypertension clinics.

Results

A total of 208 patients who were on treatment for hypertension were included in the study, 129 (62%) were females, and 79 (38) were males. Half (50%) of the participants pay out of pocket for their medications and 99 (47.5%) participants have family members paying for their medication.

Article DNA

Article Type:
Research Article

DOI:
10.5281/zenodo.17484548

Article History:
Received: 28-09-2025
Accepted: 09-10-2025
Published: 30-10-2025

Keywords:
Hypertension, cost, out-of-pocket, antihypertensives,

How to Cite

Ogundele SO, Ajibare AO², Amisu M, & Dada AO. (2025). Cost and sources of financing treatment of hypertension in patients attending a tertiary health care centre in a developing country: a cross-sectional review. UAR Journal of Multidisciplinary Studies (UARJMS), 1(8), 1–13. <https://doi.org/105281/zenodo.17484548>

License Information

Copyright © 2025 The Author(s). This is an open-access article distributed under the terms of the [Creative Commons Attribution License \(CC BY 4.0\)](https://creativecommons.org/licenses/by/4.0/), which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

***Related declarations are provided in the final section of this article.*

Market survey of cost of the commonly prescribed anti-hypertensive drugs in the community pharmacies showed that diuretic agents are the cheapest and generic medications are relatively cheaper compared to the branded anti-hypertensive agents.

Conclusion

In conclusion, this study showed that most of our patients still pay out of pocket for their medications, most patients with hypertension seen in our clinics are on at least three antihypertensive medications and that the use of generic medications is cheaper compared to the branded ones and this is recommended for patients attending hypertension clinics in developing countries.

Introduction

Hypertension is a chronic medical disorder of global importance, with increasing prevalence and economic burden. *Oseni 2023; Jarari 2015*. It is estimated that 1.28 billion adults aged 30-79 years worldwide have hypertension, with about two-thirds living in low- and middle-income countries. *WHO 2023*. An estimated 46% of adults with hypertension are unaware that they have the condition. *WHO 2023*. Hypertension affects many Nigerians, the age-adjusted prevalence of hypertension in Nigeria among adults aged 20 years and above was 32.5% in 2020, with about 27.5 million individuals affected. *Adeloye 2021; WHO 2020*.

The monetary cost of treating hypertension could cause a serious economic hardship for patients, their households, and the community. *Ipinnimo 2023*. It is estimated that the average health care cost associated with hypertension in the United States is approximately \$1,500-\$2,500 per person yearly, resulting in total annual expenditures for medical services that exceeds \$100 billion. *Wang 2024*.

Most Nigerians still pay for health care on out-of-pockets basis (OOP). *Aregbeshola 2018*. To mitigate against OOP for health care, WHO is advocating the Universal health coverage which gives all people access to the full range of quality health services they need, when and where they need them, without financial hardship. *WHO 2005 and 2022*.

Understanding the cost of treatment of hypertension, source of funding for the treatment and the payment mechanism is important for the development of effective healthcare policy and intervention. The main aim of this study is to assess the cost of treating hypertension in an urban tertiary health facility in a developing country. The study objectives are; assessment of the baseline clinical profile of patients seen at the hypertension clinic, assessment of the employment

status of the study participants, assessment of average cost of antihypertensive drugs, source of payment for anti-hypertensive drugs, and a market survey of cost of antihypertensive medications.

Methodology

The study took place at the hypertension clinic of Lagos State University Teaching Hospital (LASUTH), Ikeja. The hospital is a 750 bedded tertiary centre that serves residents of Lagos state and other surrounding states.

All patients diagnosed with hypertension attending the hypertension clinic and currently on anti-hypertensive medications for at least three months at our clinics were eligible to participate in the study. Patients who refuse to give consent for participation in the study were excluded. A structured questionnaire was used to obtain relevant information for the study. Information required were; baseline clinical profile of patient (current blood pressure measurement, weight, height), name of anti-hypertensive medications, employment status, monthly cost of anti-hypertensive medications, and source of payment for the medications. A market survey for the current cost of commonly used anti-hypertensive drugs will be done.

The sample size was calculated based on the national prevalence of hypertension in Nigeria that is 31.2%. *Adeloye 2021*. The minimum calculated sample size was 168 participants.

Protocol was submitted to the institutional ethics committee for review and approval.

Data collected with the questionnaires was transferred on to a data base using the SPSS version 22 data base for storage and analysis. Quantitative data were summarized as mean (SD) and qualitative data were summarized as count and percentages. Association between two or more qualitative variables was tested with the Chi-square test and p value of ≤ 0.05 will be considered as being statistically significant.

Result

A total of 208 patients who were on treatment for hypertension were included in the study, 129 (62%) were females, and 79 (38) were males. The mean age of the study participants was 57 ± 13.4 years and a range of 20-90 years. The recorded clinic visit blood pressure was controlled in 108 (52%) of the participable. The diastolic blood pressure was better controlled compared to the

systolic blood pressure among the participants; 148 (70%) and 124 (60%) respectively. Table 1 shows the demographic and the baseline clinical profile of the participants.

Half (50%) of the participants pay out of pocket for their medications and 99 (47.5%) participants have family members paying for their medication. The most commonly prescribed antihypertensive drug in this study were the calcium channel blockers in 159 (76%) of the study participants. Statins and antiplatelets were also prescribed in 73 (35%) and 64 (31%) of the participants respectively. The prescription pattern of antihypertensive medications showed that 12 (6%) of the study participants were using one antihypertensive agent, and a little over half, 105 (51%) of the participants, were on 3 or 4 antihypertensive medications. More than half of the participants earn less than one hundred thousand naira in a month; 25 (12%) do not earn any income, 69 (33%) earn less than fifty thousand naira (N50,000) per month and 66 (32%) earn between fifty thousand (N50,000) and one hundred thousand naira (N100,000) per month. The monthly cost of treating hypertension in 16% of the participants is less than ten-thousand (N10,000). The details about antihypertensive prescription patterns, monthly income and monthly expenditure on medication are described in Table 2.

Market survey of cost of the commonly prescribed anti-hypertensive drugs in the community pharmacies showed that diuretic agents are the cheapest and generic medications are relatively cheaper compared to the branded anti-hypertensive agents. See table 3 for details.

A cross tabulation of the monthly income of the participants and their employment status did not show any significant correlation with the control of blood pressure. Details are described in table 4.

Table 1: Demographic and baseline clinical profile of study participants,

| Variables | Number | Percentage |
|------------------------------|---------------|-------------------|
| Sex | | |
| Male | 79 | 38 |
| Female | 129 | 62 |
| Age group (years) | | |
| 18- 39 | 19 | 9 |
| 40-59 | 94 | 46 |
| 60 and above | 85 | 45 |
| Blood pressure (mmhg) | | |
| <140/90 (Controlled) | 108 | 52 |
| ≥140/90 (Uncontrolled) | 100 | 48 |
| SBP <140 | 124 | 60 |
| DBP <90 | 148 | 70 |

| | | |
|--------------------------|-----|----|
| CVD complications | | |
| Heart failure | 9 | 4 |
| Stroke | 7 | 4 |
| CKD | 34 | 16 |
| No known complications | 158 | 76 |
| Employment status | | |
| Employee | 45 | 21 |
| Self employed | 87 | 42 |
| Not employed | 14 | 7 |
| Retired | 62 | 30 |

Table 2: Prescription pattern, monthly income, source of funding and monthly expenditure on medication by the study participants.

| Variables | Number | Percentage |
|--|---------------|-------------------|
| Number of medications | | |
| One | 12 | 6 |
| Two | 37 | 18 |
| Three to four | 105 | 51 |
| Five or more | 54 | 25 |
| Class of medication | | |
| Calcium channels blockers | 159 | 76 |
| Diuretics | 103 | 50 |
| ARBs | 92 | 44 |
| ACEIs | 51 | 25 |
| Beta blockers | 72 | 35 |
| Centrally acting agents | 16 | 8 |
| Statins | 73 | 35 |
| Antiplatelet | 64 | 31 |
| Monthly income (Naira) | | |
| No income | 25 | 12 |
| Less than 50,000 | 69 | 33 |
| 50,000 to 99,000 | 66 | 32 |
| 100,000 to 199,000 | 21 | 10 |
| 200,000 to 499,000 | 23 | 11 |
| 500,000 and above | 4 | 2 |
| Average monthly expenditure on medication (Naira) | | |
| Less than 10,000 | 33 | 16 |
| 10,000 to 29,000 | 85 | 41 |
| 30,000 to 49,000 | 50 | 24 |
| 50,000 and above | 40 | 19 |
| Source of payment for medication | | |
| Out of pocket | 104 | 50 |
| Employers | 1 | 0.5 |
| Family member | 99 | 47.5 |
| Insurance | 4 | 2 |

Table: 3. Market survey of cost of medication at community pharmacies

| Class of medication | Cost of monthly dose (Naira) |
|---|-------------------------------------|
| Calcium channel blocker (amlodipine) | |
| Branded | N9,300 |
| Generic | N2,400 |
| Diuretic (indapamide) | |
| Branded | N13,000 |
| Generic | N4,450 |
| Amiloride Hydrochloride/HCT | |
| Branded | N5,925 |
| Generic | N750 |
| ACEI (lisinopril) | |
| Branded | N7,125 |
| Generic | N1,7000 |
| ARB (Valsartan) | |
| Branded | N15,000 |
| Generic | N6,000 |
| ARB (telmisartan) | |
| Branded | N12,750 |
| Generic | N4,950 |
| Beta blocker (carvedilol) | |
| Branded | N8,000 |
| Generic | N5,000 |
| Fixed dose combination | |
| Valsartan/amlodipine/HCT (branded) | N28,500 |
| Valsartan/amlodipine/HCT (generic) | N15,000 |
| Telmisartan/amlodipine (branded) | N42,000 |
| Telmisartan/amlodipine (generic) | N10,000 |

Table 4: Cross tabulation of some variables with blood pressure control.

| Variable | Blood pressure status | | Chi square |
|--------------------------|------------------------------|---------------------------|-------------------|
| | Controlled (N) | Not controlled (N) | |
| Monthly income | | | |
| No income | 10 | 15 | $\chi^2=0.43$ |
| Less than 50,000 | 36 | 33 | |
| 50,000 to 99,000 | 39 | 27 | |
| 100,000 to 199,000 | 9 | 12 | |
| 200,000 to 499,000 | 13 | 10 | |
| 500,000 and above | 1 | 3 | |
| Employment status | | | |
| Not employed | 5 | 9 | $\chi^2=0.41$ |
| Employee | 23 | 22 | |
| Self employed | 50 | 37 | |
| Retired | 30 | 32 | |

Discussion

This study provides valuable insights into the cost of management of hypertension and source of funding this treatment.

The study reveals a higher proportion of female participants (62%) compared to males (38%) with hypertension attended the clinic during the study period. Hypertension generally is commoner in males; females experience a much sharper increase in their blood pressure from the third decade of life and consequently the prevalence of hypertension accelerates comparatively with age. *Connelly2022*. However, the higher proportion of female participants in this study is likely to be a reflection of a more positive health seeking behaviour in the females attending our clinic compared to the males.

The mean age of the study participants was 57 ± 13.4 years, with a significant proportion of participants (45%) aged 60 years and above. This highlights the need for targeted interventions to screen and manage hypertension in older adults as they are more likely to have hypertension. *Fryar 2024; NCD 2022*. The prevalence as well as severity of hypertension both increase with age, in the older adults over 60 years of age prevalence of hypertension exceeds 60%. *NCD 2022*.

The study shows that blood pressure was well controlled in 52% of the participants, with diastolic blood pressure better controlled compared to systolic blood pressure. This finding is consistent with previous studies that have shown that diastolic blood pressure is often easier to control than systolic blood pressure. *Mancia 2002*. Studies have also showed that systolic blood pressure is a better predictor of risk for cardiovascular disease compared to the diastolic pressure. *Strandberg and Pitkala 2003*.

The finding of the study that showed that calcium channel blockers as the most commonly prescribed class of antihypertensive medication is consistent with reports from previous studies and a systematic review. *Ogundele 2018; Ojji 2019; Jarari 2015*. However, another systematic review of the prescription pattern of antihypertensive medications in studies done between 2010 and 2019 showed that, the most commonly prescribed antihypertensives as monotherapy in adult patients with no comorbidities were angiotensin converting enzymes inhibitors (ACEIs) and angiotensin receptors blockers (ARBs), followed by CCBs, this report is at variance with our finding. *Abdelkader2023*.

The study also shows that a significant proportion of participants (51%) were on three or four antihypertensive medications, highlighting the complexity of hypertension management. Most patients with hypertension will require more than one drug for effective control of their blood pressure. *Jarari 2015*. The finding that two or more antihypertensive medications are prescribed in patients with hypertension is consistent with findings from previous studies and review. *Jarari 2015; Ogundele 2018; Joseph 2014*.

The study shows that more than half of the participants earn less than one hundred thousand naira in a month, with 25 (12%) not earning any income. The monthly cost of treating hypertension in 41% of the participants is between ten-thousand (N10,000) to thirty thousand naira (N30,000). This expenditure is between 14% to 43% of Nigeria's minimum monthly wage of seventy thousand naira (N70,000). The cost of medications is a barrier to an effective treatment of chronic medical diseases. The cost of medication influences the prescribing patterns among physicians and compliance to the treatment by the patients, in countries where patients pay out of pocket for their medication. *WHO 2023*. Most of the participants in the study are either paying out-of-pocket or a family member paying for them. Majority of the study participants spend less than fifty thousand naira monthly to purchase their antihypertensive agents. The finding from this study is in line with findings from a previous review on out-of-pocket funding for health care in Nigeria. The review posited that over 90% of Nigerians pay on out-of-pocket basis as a means of financing health system in Nigeria. *Kirkland, 2018 Aregbeshola 2018*. Out-of-pocket payments for health care leads to catastrophic health spending for between 2% and 69% of households in the poorest fifth of the population. *WHO 2023*. People who experience catastrophic health spending may not be able to pay for other basic needs such as food, housing and heating.

The price ranges from the market survey for the antihypertensive agents showed that; diuretics are the least expensive antihypertensive agents, b-blockers are generally less expensive than ACE inhibitors, and calcium channels blocker and ARBs are the most expensive drugs, especially the long-acting CCBs. *Moser1998*. There is no evidence that expensive medications are more effective or more tolerable for patients, or decrease morbidity or mortality to a greater extent than the cheaper agents. *Moser1998*. Studies have shown that use of generics is associated with comparable clinical outcomes compared to use of brand-name products. *Desai 2019; Hass 2005*. Generic drugs contain equivalent amounts of the same active ingredients as their brand-name counterparts, but usually cost far less. *Kesselheim 2008; Hass 2005*. Randomized

controlled trials comparing efficacy between generic and brand-name products are generally not required by regulators for generic drug approval. *Desai 2019*. According to WHO research, it estimated 1 in 10 medical products circulating in low- and middle-income countries is either substandard or faked. This information should be considered when we have poor response to pharmacotherapy in our patients. *WHO 2017*.

Cross-tabulation of monthly income and blood pressure control did not show any significant correlation. A former US surgeon General, C. Everett Koop, once said that ‘drugs don't work in patients who don't take them. *Lindenfeld 2017*. The finding that there is no correlation in this study between monthly income of participants and control of blood pressure suggests that other factors, such as adherence to medication and lifestyle modifications, play a more significant role in determining blood pressure control. *Ogundele 2016; Oseni 2023*.

Limitations

This study has some limitations. The cross-sectional design limits our ability to establish causality between variables. Additionally, the study was conducted in a single hospital setting, which may limit the generalizability of our findings to other settings.

Conclusion

In conclusion, this study showed that most of our patients still pay out of pocket for their medications, most patients with hypertension seen in our clinics are on at least three antihypertensive medications and that the use of generic medications is cheaper than the branded ones and this is recommended for patients attending hypertension clinics in developing countries.

Article Publication Details

This article is published in the **UAR Journal of Multidisciplinary Studies (UARJMS)**, ISSN 3049-4346 (Online). In Volume 1 (2025), Issue 8 (October)

The journal is published and managed by **UAR Publisher**.

Acknowledgements

We sincerely thank the editors and the reviewers for their valuable suggestions on this paper.

All authors read and approved the final manuscript.

Data availability

No datasets were generated or analyzed during the current study.

Declarations

Ethics approval and consent to participate

Not applicable. This study did not involve human or animal subjects.

Funding

The authors declare that no funding was received for this work.

Competing interests

The authors declare that they have no competing interests.

References

- Abdelkader, N. N., Awaisu, A., Elewa, H., & El Hajj, M. S. (2023). Prescribing patterns of antihypertensive medications: A systematic review of literature between 2010 and 2020. *Exploratory Research in Clinical and Social Pharmacy*, *11*, 100315. <https://doi.org/10.1016/j.rcsop.2023.100315>
- Adeloye, D., Owolabi, E. O., Ojji, D. B., Auta, A., Dewan, M. T., Olanrewaju, T. O., Ogah, O. S., Omoyele, C., Ezeigwe, N., Mpazanje, R. G., Gadanya, M. A., Agogo, E., Alemu, W., Adebisi, A. O., & Harhay, M. O. (2021). Prevalence, awareness, treatment, and control of hypertension in Nigeria in 1995 and 2020: A systematic analysis of current evidence. *Journal of Clinical Hypertension*, *23*(5), 963–977. <https://doi.org/10.1111/jch.14220>
- Aregbeshola, B. S., & Khan, S. M. (2018). Out-of-pocket payments, catastrophic health expenditure and poverty among households in Nigeria 2010. *International Journal of Health Policy and Management*, *7*(9), 798–806. <https://doi.org/10.15171/ijhpm.2018.19>
- Connelly, P. J., Currie, G., & Delles, C. (2022). Sex differences in the prevalence, outcomes and management of hypertension. *Current Hypertension Reports*, *24*(6), 185–192. <https://doi.org/10.1007/s11906-022-01183-8>
- Desai, R. J., Sarpatwari, A., Dejene, S., Khan, N. F., Lii, J., Rogers, J. R., Dutcher, S. K., Raofi, S., Bohn, J., Connolly, J. G., Fischer, M. A., Kesselheim, A. S., & Gagne, J. J. (2019). Comparative effectiveness of generic and brand-name medication use: A database study of US health insurance claims. *PLoS Medicine*, *16*(3), e1002763. <https://doi.org/10.1371/journal.pmed.1002763>

Fryar, C. D., Kit, B., & Carroll, M. D. (2024). *Hypertension prevalence, awareness, treatment, and control among adults age 18 and older: United States, August 2021–August 2023* (NCHS Data Brief No. 511). National Center for Health Statistics. <https://doi.org/10.15620/cdc/164016>

Haas, J. S., Phillips, K. A., Gerstenberger, E. P., & Seger, A. C. (2005). Potential savings from substituting generic drugs for brand-name drugs: Medical expenditure panel survey, 1997-2000. *Annals of Internal Medicine*, 142(11), 891–897. <https://doi.org/10.7326/0003-4819-142-11-200506070-00006>

Ipinnimo, T. M., Emmanuel, E. E., Ipinnimo, M. T., Agunbiade, K. H., & Ilesanmi, O. A. (2023). Financial cost of hypertension in urban and rural tertiary health facilities in Southwest, Nigeria: A comparative cross-sectional study. *Indian Journal of Community Medicine*, 48(2), 340–345. https://doi.org/10.4103/ijcm.ijcm_431_22

James, P. A., Oparil, S., Carter, B. L., Cushman, W. C., Dennison-Himmelfarb, C., Handler, J., Lackland, D. T., LeFevre, M. L., MacKenzie, T. D., Ogedegbe, O., Smith, S. C., Jr., Svetkey, L. P., Taler, S. J., Townsend, R. R., Wright, J. T., Jr., Narva, A. S., & Ortiz, E. (2014). 2014 evidence-based guideline for the management of high blood pressure in adults: Report from the panel members appointed to the Eighth Joint National Committee (JNC 8). *JAMA*, 311(5), 507–520. <https://doi.org/10.1001/jama.2013.284427>

Jarari, N., Rao, N., Peela, J. R., Ellafi, K. A., Shakila, S., Said, A. R., & Reda, A. (2016). A review on prescribing patterns of antihypertensive drugs. *Clinical Hypertension*, 22(1), 7. <https://doi.org/10.1186/s40885-016-0042-0>

Joseph, S., Verghese, N., & Thomas, L. (2014). A study on prescribing pattern of antihypertensive medications in a tertiary care hospital in Malabar region. *Der Pharmacia Lettre*, 6(4), 132–137.

Kesselheim, A. S., Misono, A. S., Lee, J. L., Stedman, M. R., Brookhart, M. A., Choudhry, N. K., & Shrank, W. H. (2008). Clinical equivalence of generic and brand-name drugs used in cardiovascular disease: A systematic review and meta-analysis. *JAMA*, 300(21), 2514–2526. <https://doi.org/10.1001/jama.2008.758>

Kirkland, E. B., Heincelman, M., Bishu, K. G., Schumann, S. O., Schreiner, A., Axon, R. N., Ma, A., & Moran, W. P. (2018). Trends in health care expenditures among US adults with hypertension: National estimates, 2003–2014. *Journal of the American Heart Association*, 7(11), e008731. <https://doi.org/10.1161/JAHA.118.008731>

Lindenfeld, J., & Jessup, M. (2017). ‘Drugs don’t work in patients who don’t take them’ (C. Everett Koop, MD, US Surgeon General, 1985). *European Journal of Heart Failure*, 19(11), 1412–1413. <https://doi.org/10.1002/ejhf.920>

Mancia, G., Bombelli, M., Lanzarotti, A., Grassi, G., Villa, G., & Sega, R. (2002). Systolic vs diastolic blood pressure control in the hypertensive patients of the PAMELA population. *Archives of Internal Medicine*, 162(5), 582–586. <https://doi.org/10.1001/archinte.162.5.582>

Moser, M. (1998). The cost of treating hypertension: Can we keep it under control without compromising the level of care? *American Journal of Hypertension*, 11(8 Pt 2), 120S–127S. [https://doi.org/10.1016/s0895-7061\(98\)00106-x](https://doi.org/10.1016/s0895-7061(98)00106-x)

National High Blood Pressure Education Program. (2004). *The seventh report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure* (NIH Publication No. 04-5230). National Heart, Lung, and Blood Institute. <https://www.ncbi.nlm.nih.gov/books/NBK9630/>

NCD Risk Factor Collaboration (NCD-RisC). (2021). Worldwide trends in hypertension prevalence and progress in treatment and control from 1990 to 2019: A pooled analysis of 1201 population-representative studies with 104 million participants. *The Lancet*, 398(10304), 957–980. [https://doi.org/10.1016/S0140-6736\(21\)01330-1](https://doi.org/10.1016/S0140-6736(21)01330-1)

Ogundele, S. O., Dada, A. O., & Ale, A. O. (2018). Adherence to anti-diabetes medications among adults attending a tertiary health centre in Lagos- A cross-sectional survey. *LASU Journal of Health Sciences*, 1(1), 19–23.

Ogundele, S. O., Dada, A. O., & Mosuro, O. R. (2016). Clinical profile, knowledge, and beliefs about diabetes among patients attending a tertiary health centre in Lagos: A cross-sectional survey. *Nigerian Journal of Clinical Practice*, 19(4), 508–512. <https://doi.org/10.4103/1119-3077.183303>

Ojji, D. B., Mayosi, B., Francis, V., Badri, M., Cornelius, V., Smythe, W., Kramer, N., Wiysonge, C., Ogah, O. S., Fraser, B., Steyn, K., Awotodu, A., Dzudie, A., Bastiaanse, K., & CREOLE Study Investigators. (2019). Comparison of dual therapies for lowering blood pressure in black Africans. *New England Journal of Medicine*, 380(25), 2429–2439. <https://doi.org/10.1056/NEJMoa1901113>

Oseni, T. I., Emonriken, A., Ahmed, S. D., & Dic-Ijiewere, M. (2023). Determinants of blood pressure control among hypertensive patients attending a rural teaching hospital in Southern Nigeria. *Nigerian Journal of Clinical Practice*, 26(3), 260–266. https://doi.org/10.4103/njcp.njcp_1678_21

Strandberg, T. E., & Pitkala, K. (2003). What is the most important component of blood pressure: Systolic, diastolic or pulse pressure? *Current Opinion in Nephrology and Hypertension*, 12(3), 293–297. <https://doi.org/10.1097/00041552-200305000-00010>

Wang, Y., Lee, J. S., Pollack, L. M., Kumar, A., Honeycutt, S., & Luo, F. (2024). Health care expenditures and use associated with hypertension among U.S. adults. *American Journal of Preventive Medicine*, 67(6), 820–831. <https://doi.org/10.1016/j.amepre.2024.07.005>

World Health Organization. (2005). *Sustainable health financing, universal coverage and social health insurance* (Resolution WHA58.33). https://apps.who.int/gb/ebwha/pdf_files/WHA58/WHA58_33-en.pdf

World Health Organization. (2017, November 28). *1 in 10 medical products in developing countries is substandard or falsified*. <https://www.who.int/news/item/28-11-2017-1-in-10-medical-products-in-developing-countries-is-substandard-or-falsified>

World Health Organization. (2020, September 9). *Nigeria collaborates with WHO to curb hypertension, introduces control initiative*. WHO Regional Office for Africa. <https://www.afro.who.int/news/nigeria-collaborates-who-curb-hypertension-introduces-control-initiative>

World Health Organization. (2022, April 8). *Reducing out-of-pocket health expenditure, a panacea to universal health coverage*. WHO Regional Office for Africa. <https://www.afro.who.int/news/reducing-out-pocket-health-expenditure-panacea-universal-health-coverage>

World Health Organization. (2023a, March 16). *Hypertension*. <https://www.who.int/news-room/fact-sheets/detail/hypertension>

World Health Organization. (2023b, December 12). *Out-of-pocket payments for primary health care unaffordable for millions in Europe, new WHO report shows*. WHO Regional Office for Europe. <https://www.who.int/europe/news/item/12-12-2023-out-of-pocket-payments-for-primary-health-care-unaffordable-for-millions-in-europe-new-who-report-shows>