

An Analysis of the Prevalence and Risk Factors of Hypertension in Ghana: A Systematic Review

Jesse Kwaku Doe¹, Mercy Asaa Asiedu²

¹College of Health Sciences, University of Ghana, Accra, Ghana

²Department of Management, Graduate School of Management, Abidjan, Ivory Coast

Email address:

jessekdoe@gmail.com (Jesse Kwaku Doe), akusid@yahoo.com (Mercy Asaa Asiedu)

To cite this article:

Jesse Kwaku Doe, Mercy Asaa Asiedu. An Analysis of the Prevalence and Risk Factors of Hypertension in Ghana: A Systematic Review. *World Journal of Public Health*. Vol. 8, No. 4, 2023, pp. 261-265. doi: 10.11648/j.wjph.20230804.12

Received: August 20, 2023; **Accepted:** September 13, 2023; **Published:** October 8, 2023

Abstract: The purpose of this paper is to analyze the prevalence and risk factors of hypertension in Ghana. Available records suggest a growing rise in hypertension prevalence in Ghana, accounting for close to 5% of the total admissions and about 15% of the total deaths in Ghana. The most common contributors to this increased prevalence include changing lifestyle and dietary choices as well as rural–urban migration. Other contributors to the issue include genetic predisposing factors and behavioural risk factors such as eating foods with high salt and fat content, low fruit and vegetable inclusion in diet, excessive alcohol use, positive perception of obesity, smoking, insufficient physical activity, poor management of stress and increasing life-expectancy. These risk factors are discussed under two main arms as; non-modifiable and modifiable risk factors. Employing a semi-systematic literature review research design, this paper reviews hypertension epidemiology in Ghana from an extensively large pool of research studies that investigate hypertension prevalence, medical therapy management and risk factor profile in Ghana. The main revelation from this work is the high prevalence of hypertension in specific groups with higher vulnerability such as women with low income, and the elderly with poor access to healthcare. This review also revealed a lack of a nationally representative, population-based dataset on hypertension in Ghana. This is of utmost importance to monitor the trends in hypertension prevalence across varied population demographics, socio-economic class, and time periods.

Keywords: Hypertension, Cardiovascular Disease, Non-Communicable Disease, Risk Factors, Prevalence

1. Introduction

Hypertension remains a major disease of global public health concern, with both economic and social implications for many countries [1]. Elevated blood pressure (BP) predisposes patients to the development and progression of cardiovascular diseases (CVD). It is estimated that a little under 50% of global mortality can be attributed to non-communicable diseases [2]. The rising prevalence of hypertension in developing countries, due to inadequate control of BP, plays a major role in the increasing non-communicable diseases (NCDs) burden [3]. Hypertension is recorded as being most prevalent in the sub-Saharan Africa [4]. A good number of people living with hypertension are without visible clinical symptoms and are therefore at a higher risk of having sudden and fatal cardiovascular events. This speaks to the alias of the disease as “the silent killer” [5].

Generally, hypertension can be classified under primary or secondary hypertension, depending on the cause. It is considered as primary when the elevated BP is not directly attributable to an existing medical condition. In contrast, secondary hypertension occurs as a result of an underlying medical condition [6, 7].

In Ghana, hypertension causes many admissions and deaths [8]. It accounts for close to 5% of the total admissions and about 15% of the total deaths in Ghana, in 2017; making hypertension among the top three leading causes of admissions and deaths in Ghana [9]. At present, available records suggest a growing rise in hypertension prevalence. The most common contributors to this increased prevalence include changing lifestyle and dietary choices as well as rural–urban migration. Other contributors to the issue include genetic predisposing factors and behavioural risk factors such as eating foods with high levels of salt and fat content, low fruit and vegetable inclusion in diet, excessive alcohol use,

positive perception of obesity, smoking, insufficient physical activity, poor management of stress and increasing life-expectancy [2, 10, 11]. These risk factors are discussed under two main arms as; non-modifiable and modifiable risk factors. Non-modifiable risk factors cover age, sex, race, family history, and genetic composition. Alternatively, modifiable risk factors consist of obesity, excessive salt consumption, excessive alcohol intake, high fat diet, lack of exercise, and smoking [1, 5]. In Africa, advanced age and obesity are the more common risk factors for hypertension and its associated complications. For instance, a prospective study in Ghana revealed a high risk for stroke incidence in elderly patients with elevated BP [9, 12].

Most developing nations struggle with limited healthcare resources to tackle both non-communicable disease and the more pressing burden of communicable diseases such as malaria, tuberculosis, HIV/AIDS, and now COVID-19 [13]. Non-communicable diseases receive minimal resource allocations, since the greater portion of the resources are directed towards the fight against infectious diseases [2, 14].

Several researchers predict that the rising prevalence and burden of hypertension in Ghana is most likely going to worsen [15]. Attempts have been made by many researchers over the past years to unravel the burden of hypertension in Ghana [2]. The Government of Ghana, in response, has put together national strategic documents on nutrition and non-communicable diseases with the goal of reducing the burden of hypertension in Ghana. A revised draft on the national Non-communicable disease policy of Ghana has also been developed towards achieving this goal [9].

2. Literature Review

Many studies have been done to investigate the prevalence of hypertension in Ghana, over the past decade. This provides an extensively large pool of research to systematically review prevalence of hypertension in Ghana and appropriately dispel common misconceptions regarding causal relationships [2]. It is worth noting that observational studies predominantly used in epidemiology are associated with many inherent limitations [16]. That is to say, observational studies may not necessarily compensate for the complexity of uncontrolled conditions associated with a disease state in real time; hence, a suitable blend of various studies may be required before an observed association can be translated into a cause-effect relationship. For this reason, systematic reviews of a number of related observational studies are an appropriate method to overcome the inherent limitations of establishing acceptable causal relationships [17]. Fortunately, a number of reports and studies have been published on hypertension in Ghana [10, 13, 18]. Yet, national population data on hypertension prevalence in Ghana remains scanty. This work is therefore a semi-systematic review on hypertension epidemiology in Ghana. Studies that investigate hypertension prevalence, medical therapy management and risk factor profile in Ghana, are reviewed. The first section discusses the general protocol for

BP measurement in Ghana. The studies under review showed that validated standard operating procedures were used by appropriately trained healthcare workers. The next step was to review the classifications after the BP check, into suitable categories [19, 20]. A number of studies classified hypertension based on the Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC VII) classification; this defines hypertension as a systolic BP ≥ 140 mmHg and a diastolic BP ≥ 90 mmHg [2, 21]. Many of the articles reviewed showed that patients were seated quietly in a serene place for the BP check. Also, the general trend showed that patients were required to take at least 5 minutes of rest prior to the BP check. The BP check is usually taken at the upper arm [22].

The second section discusses the prevalence of hypertension in Ghana, according to the available research studies. A study by Stringhini et al., (2016) estimated that about 4% of a chosen rural population in the Ashanti Region were hypertensive [23]. Another article by Osman et al., (2017) in the same region showed a hypertension prevalence of about 54% in older adults' ≥ 65 years [24]. A meta-analysis by Atibila et al., (2021), showed a combined total of about 35% of 30,033 subjects, from different twenty studies were reported as being hypertensive [2]. Atibila et al., (2021) went on to suggest a pooled nationwide estimate for hypertension prevalence of about 49% in adults >50 years, based on their analysis of two studies by Minicuci et al., (2014) and Nuerter et al., (2017) [2, 25, 26].

An attempt to establish a strong association between socioeconomic class and prevalence of hypertension is flawed by the contrary trend from a study by Dosoo et al., (2019) which showed a higher prevalence of hypertension in the southern parts of Ghana (believed to house the more elite members of society), at 30.7% compared to 22.9% recorded for the northern parts of Ghana [1]. However, this study may have an inherent bias as a good number of people in the Northern part of Ghana are not adequately educated. It is opined that many northerners with hypertension are unaware of the diseases. Additionally, inadequate access to good healthcare may contribute to the bias of the study [2]. Sanuade et al. in 2018 suggested in a study that about 59% of the sample were living with uncontrolled hypertension [27]. For these reasons, a simple questionnaire method may not sufficiently paint the full picture of hypertension prevalence in the northern part of Ghana. It may have been more ideal to include interviews to fish out all the data that are better expressed in conversation.

Sex as a determinant of elevated BP is postulated by many studies [2, 9, 27]. A review revealed that hypertension may be more prevalent in males than in females. In the elderly, the trend appears to be reversed, where more females show elevated BP on average [10].

Advancing age is a non-modifiable risk factor for hypertension. Many different studies showed an age related trend in hypertension prevalence. The general trend in these studies show a directly proportional relationship between advancing age and prevalence of hypertension [1, 29]. This

risk factor satisfies the bulk of the checklist for causal relationship under the Bradford-Hill criteria; primarily showing a strong association between age and hypertension prevalence, that consistently runs through many different studies. This can be attributed to cell senescence; and changes in renal sodium metabolism and the renin-aldosterone pathway, and oxidative stress resulting in micro-vascular injury and chronic inflammation, enhanced sensitivity to sympathetic innervation, and loss of arterial and arteriolar elasticity, and also suppressed baroreceptor sensitivity [30].

The major limitation observed across a number of the studies is that many of the diagnoses of hypertension were based on results from a single visit; this could give false-positives on diagnoses and ultimately result in inaccurate estimations of hypertension prevalence. Additionally, the pooling of results across various observational studies in a systematic review, gives room for possible duplications of populations that are viable samples for different studies [2, 10].

3. Results

The pooled prevalence of hypertension of about 35% out of 30,033 subjects, as reviewed by Atibila et al., (2021) resonates with findings from many other studies that have been previously conducted in the general Ghanaian populace, over the last 10 years [1, 2]. The proposal of age as a non-modifiable determinant of hypertension also resonates with existing data representing hypertension among younger adults within the sub-Saharan region of Africa [31]. The many studies conducted across Africa, show the hypertension prevalence has continued growing the last 10 years [32]. This paper reveals the lack of a nationally representative and population-based dataset on hypertension in Ghana, which is key to monitoring the trends in hypertension prevalence across varied population demographics, socio-economic classes and time periods [1, 11].

4. Discussion and Implications

The implications on health and healthcare systems are alarming and call for an innovative public health approach to tackle the issue. Public health education to dispel misconceptions is a very important step in this approach. Similarly, the effects of socio-economic class on access to healthcare must be taken head on [33]. Digital health interventions are another avenue to tackle the growing burden of hypertension in Ghana. A model described by Band et al., (2017) provides an automated and remote system to support self-management as well as offer users flexibility and convenience with a personalized feedback and advice tools [34].

Policy developments are also a necessity, if the growing trend of hypertension can be properly curbed. At present, Ghana is on board the United Nations Sustainable Development Goal aimed at achieving universal health coverage (UHC). This is set to ensure that all people living in

Ghana receive optimal healthcare services, irrespective of financial strength [35].

There is the need for continuous research into effective models for hypertension care in rural parts of Ghana where there are constant shortages of trained healthcare workers, easily accessible facilities, and affordable and quality medicines.

5. Conclusion

There is a continued increase in hypertension prevalence in Ghana. This work aimed to systematically review existing studies done on hypertension in Ghana. The goal was to effectively paint the picture of the past and present state of the hypertension in Ghana, the implications on health and make recommendations for the future. The main revelation from this work is the high prevalence of hypertension in specific groups with higher vulnerability such as women with low income, and the elderly with poor access to healthcare [2, 32].

This review also reveals a lack of a nationally representative, population-based dataset on hypertension in Ghana. This is of utmost importance to monitor the trends in hypertension prevalence across varied population demographics, socio-economic classes and time periods [1, 11].

In a nutshell, this review has successfully identified various observational studies that report on the prevalence of hypertension among the Ghanaian populace; and to lay a basis for assessing trends.

References

- [1] Dosoo DK, Nyame S, Enuameh Y, Ayetey H, Danwonno H, Twumasi M, et al. Prevalence of Hypertension in the Middle Belt of Ghana: A Community-Based Screening Study. *International Journal of Hypertension*. 2019; 2019: 1089578.
- [2] Atibila F, Hoor Gt, Donkoh ET, Wahab AI, Kok G. Prevalence of hypertension in Ghanaian society: a systematic review, meta-analysis, and GRADE assessment. *Systematic Reviews*. 2021; 10: 220.
- [3] Bigna JJ, Noubiap JJ. The rising burden of non-communicable diseases in sub-Saharan Africa. *The Lancet Global Health*. 2019; 7: e1295-e6.
- [4] Noubiap JJ, Nansseu JR, Nkeck JR, Nyaga UF, Bigna JJ. Prevalence of white coat and masked hypertension in Africa: a systematic review and meta-analysis. *The Journal of Clinical Hypertension*. 2018; 20: 1165-72.
- [5] Sawicka K, Szczyrek M, Jastrzebska I, Prasal M, Zwolak A, Daniluk J. Hypertension—the silent killer. *Journal of Pre-Clinical and Clinical Research*. 2011; 5.
- [6] Huang W. Energy alterations as the underlying cause of primary hypertension. *ARC J Nephrol*. 2019; 4: 33-44.
- [7] Siru R, Conradie JH, Gillett MJ, Page MM. Approach to the diagnosis of secondary hypertension in adults. *Australian Prescriber*. 2021; 44: 165.

- [8] Nuamah K, Affran Bonful H, Danso Yeboah J, Antwi Amankwaah E, Boakye D, Kwame Owusu S, et al. Characteristics of inpatient hypertension cases and factors associated with admission outcomes in Ashanti Region, Ghana: an analytic cross-sectional study. *International Journal of Hypertension*. 2017; 2017.
- [9] Bosu W, Bosu D. Prevalence, awareness and control of hypertension in Ghana: A systematic review and meta-analysis. *PloS one*. 2021; 16: e0248137.
- [10] Bosu WK, Aheto JMK, Zucchelli E, Reilly ST. Determinants of systemic hypertension in older adults in Africa: a systematic review. *BMC Cardiovasc Disord*. 2019; 19: 173.
- [11] Ibrahim MM, Damasceno A. Hypertension in developing countries. *The Lancet*. 2012; 380: 611-9.
- [12] Sarfo FS, Mobula LM, Adade T, Commodore-Mensah Y, Agyei M, Kokuro C, et al. Low blood pressure levels & incident stroke risk among elderly Ghanaians with hypertension. *Journal of the Neurological Sciences*. 2020; 413.
- [13] Nyirenda MJ. Non-communicable diseases in sub-Saharan Africa: understanding the drivers of the epidemic to inform intervention strategies. *Int Health*. 2016; 8: 157-8.
- [14] Kushitor MK, Boatemaa S. The double burden of disease and the challenge of health access: Evidence from Access, Bottlenecks, Cost and Equity facility survey in Ghana. *PLoS One*. 2018; 13: e0194677.
- [15] Laar AK, Adler AJ, Kotoh AM, Legido-Quigley H, Lange IL, Perel P, et al. Health system challenges to hypertension and related non-communicable diseases prevention and treatment: perspectives from Ghanaian stakeholders. *BMC Health Serv Res*. 2019; 19: 693.
- [16] Chastin SF, De Craemer M, De Cocker K, Powell L, Van Cauwenberg J, Dall P, et al. How does light-intensity physical activity associate with adult cardiometabolic health and mortality? Systematic review with meta-analysis of experimental and observational studies. *British journal of sports medicine*. 2019; 53: 370-6.
- [17] Dekkers OM, Vandenbroucke JP, Cevallos M, Renehan AG, Altman DG, Egger M. COSMOS-E: guidance on conducting systematic reviews and meta-analyses of observational studies of etiology. *PLoS medicine*. 2019; 16: e1002742.
- [18] Twagirumukiza M, De Bacquer D, Kips JG, de Backer G, Vander Stichele R, Van Bortel LM. Current and projected prevalence of arterial hypertension in sub-Saharan Africa by sex, age and habitat: an estimate from population studies. *Journal of hypertension*. 2011; 29: 1243-52.
- [19] James PA, Oparil S, Carter BL, Cushman WC, Dennison-Himmelfarb C, Handler J, et al. 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*. 2014; 311: 507-20.
- [20] Mancia G, Fagard R, Narkiewicz K, Redán J, Zanchetti A, Böhm M, et al. 2013 Practice guidelines for the management of arterial hypertension of the European Society of Hypertension (ESH) and the European Society of Cardiology (ESC): ESH/ESC Task Force for the Management of Arterial Hypertension. *Journal of hypertension*. 2013; 31: 1925-38.
- [21] Chobanian AV, Bakris GL, Black HR, Cushman WC, Green LA, Izzo Jr JL, et al. The seventh report of the joint national committee on prevention, detection, evaluation, and treatment of high blood pressure: the JNC 7 report. *Jama*. 2003; 289: 2560-71.
- [22] Gómez-Olivé FX, Ali SA, Made F, Kyobutungi C, Nonterah E, Micklesfield L, et al. Regional and sex differences in the prevalence and awareness of hypertension: an H3Africa AWI-Gen study across 6 sites in sub-Saharan Africa. *Global heart*. 2017; 12: 81-90.
- [23] Stringhini S, Forrester TE, Plange-Rhule J, Lambert EV, Viswanathan B, Riesen W, et al. The social patterning of risk factors for noncommunicable diseases in five countries: evidence from the modeling the epidemiologic transition study (METS). *BMC public health*. 2016; 16: 1-10.
- [24] Osman A. Nutrition & Health Status, Quality of Life, and Associated Factors among Non-Institutionalized Older Ghanaians [MPhil in Human Nutrition and Dietetics]. Kumasi: Kwame Nkrumah University of Science and Technology. 2017.
- [25] Minicuci N, Biritwum RB, Mensah G, Yawson AE, Naidoo N, Chatterji S, et al. Sociodemographic and socioeconomic patterns of chronic non-communicable disease among the older adult population in Ghana. *Glob Health Action*. 2014; 7: 21292.
- [26] Nuerter BD, Alhassan AI, Nuerter AD, Mensah IA, Adongo V, Kabutey C, et al. Prevalence of obesity and overweight and its associated factors among registered pensioners in Ghana; a cross sectional studies. *BMC obesity*. 2017; 4: 1-12.
- [27] Sanuade OA, Boatemaa S, Kushitor MK. Hypertension prevalence, awareness, treatment and control in Ghanaian population: Evidence from the Ghana demographic and health survey. *PloS one*. 2018; 13: e0205985.
- [28] Addo J, Smeeth L, Leon DA. Hypertension in sub-saharan Africa: a systematic review. *Hypertension*. 2007; 50: 1012-8.
- [29] Acheampong K, Nyamari JM, Ganu D, Appiah S, Pan X, Kaminga A, et al. Predictors of hypertension among adult female population in Kpone-Katamanso District, Ghana. *International Journal of Hypertension*. 2019; 2019.
- [30] Buford TW. Hypertension and aging. *Ageing research reviews*. 2016; 26: 96-111.
- [31] Sarki AM, Nduka CU, Stranges S, Kandala N-B, Uthman OA. Prevalence of hypertension in low-and middle-income countries: a systematic review and meta-analysis. *Medicine*. 2015; 94.
- [32] Zhou B, Bentham J, Di Cesare M, Bixby H, Danaei G, Cowan MJ, et al. Worldwide trends in blood pressure from 1975 to 2015: a pooled analysis of 1479 population-based measurement studies with 19· 1 million participants. *The Lancet*. 2017; 389: 37-55.
- [33] Jaung MS, Willis R, Sharma P, Aebischer Perone S, Frederiksen S, Truppa C, et al. Models of care for patients with hypertension and diabetes in humanitarian crises: a systematic review. *Health Policy and Planning*. 2021; 36: 509-32.
- [34] Band R, Bradbury K, Morton K, May C, Michie S, Mair FS, et al. Intervention planning for a digital intervention for self-management of hypertension: a theory-, evidence- and person-based approach. *Implementation Science*. 2017; 12: 25.

- [35] Koduah A, Nonvignon J, Colson A, Kurdi A, Morton A, van der Meer R, et al. Health systems, population and patient challenges for achieving universal health coverage for hypertension in Ghana. *Health Policy and Planning*. 2021; 36: 1451-8.