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Prevalence of Hypertension and its Awareness in Ghana

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ABSTRACT: Cardiovascular events and target organ damage stemming from hypertension, such as stroke, coronary artery disease, and renal failure, require sophisticated care, the infrastructure for which is severely underdeveloped in Ghana. Because Ghana does not have the resources to treat such advanced conditions, prevention and proper management of hypertension would lower hospitalization and mortality rates. We conducted a cross-sectional study (N=469) to evaluate hypertension prevalence and awareness in Ghana. We used a questionnaire to obtain demographic and medical data to assess risk factors for hypertension from four locations in Accra. The demographic trends of the surveyed population show a majority of women and people of low education levels. We found that the prevalence of hypertension in Ghanaians is remarkably similar to what is often reported, as 60% of our participants were hypertensive. Yet only 38% of them were aware of their hypertension. Family histories of hypertension, stroke, and diabetes were common. Furthermore, Stage 2 hypertension rates increased with age. Interventions centered around hypertension prevention and increasing awareness of common risk factors for getting high blood pressure are needed to reduce hypertension and its complications in Ghana.

KEYWORDS: Translational Medical Sciences; Disease Detection and Diagnosis; Disease Prevention; Hypertension Prevention; Ghana.

Introduction

Hypertension is a condition found worldwide that has been called the "Silent Killer" due to its asymptomatic nature but fatal consequences. The American Heart Association defines it as consistently elevated blood pressure above what is considered normal and healthy for one's age. In Ghana, hypertension is the "second leading cause of morbidity in adults older than 45 years."[1] Furthermore, it accounts for 15% of deaths in the country.[2] Hypertension can lead to stroke, vision loss, renal failure, heart failure, and sexual dysfunction, and Black individuals have a higher risk than any other group, as 55% of Black adults have high blood pressure. Additionally, some hypertension medications are less effective on Black African individuals than other populations.[3] These genetic differences, as well as cultural differences such as diet, increase hypertension rates in Ghana. Yet, few interventions address the elevated prevalence of hypertension in the country.

Blood pressure is the force that pushes blood through the blood vessels to keep blood circulating throughout the body. It is recorded by two numbers, systolic blood pressure, which measures pressure when the heart contracts, and diastolic blood pressure, which measures pressure when the heart relaxes. The CDC and the American Heart Association recognize normal blood pressure as systolic blood pressure of ≤ 120 mmHg and diastolic blood pressure of ≤ 80 mmHg. Prehypertension is the stage prior to an official diagnosis of hypertension and is defined by systolic pressure between 120-139 mmHg and diastolic pressure between 80-89 mmHg. Stage 1 hypertension is defined as systolic pressure of 130-139 and diastolic pressure of 80-89 mmHg, and Stage 2 hypertension is systolic pressure ≥140 mmHg and diastolic pressure≥90 mmHg. A hypertensive crisis, defined by a blood pressure greater than 180/120 mmHg, is a medical emergency requiring immediate medical intervention to prevent hypertensive encephalopathy, stroke, myocardial infarction, or aortic dissection.[4]

Both genetic and environmental risk factors contribute to the development of high blood pressure. For example, a diet high in sodium and lacking in fruits and vegetables, which contain potassium which counteracts the negative effects of salt, is one major environmental risk factor. Other risk factors include alcohol use, physical inactivity, and being overweight or obese.[2]

Specifically, hypertension was classified as an epidemic in Ghana in 1979.[5] A 2020 cross-sectional study shows that 58% of Ghanaian adults suffer from hypertension, which is more prevalent in women. It is predicted that this number will persist or increase with time; this is a situation for which Ghana's healthcare system is unprepared.[5] Furthermore, this study explained that only 19% of the hypertensive participants knew of their high blood pressure. Similar numbers have been reported in other African countries, namely Nigeria and Mozambique, with 14% and 15% hypertension awareness rates, respectively.[5] Hypertension awareness appears to be an immense problem in Africa as a whole. This is because awareness rates increase with education rates, which tend to be low in many African Countries.

Treatment is another challenge in Ghana. According to an article published in 2021, only 33% of Ghanaians aware of their hypertension are on any treatment. It is estimated that only 6% of hypertensive subjects have effectively controlled their blood pressure.[2]

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The consequences of hypertension at these levels are catastrophic for the people of Ghana. According to a mortality report from the Korle Bu Teaching Hospital in Accra, 11% of the autopsies performed were attributed to stroke. High blood pressure is involved in nearly 70% of all stroke cases within the country. Additionally, 69% of stroke patients died within 24 hours of the stroke's onset, indicating low success rates in managing health emergencies, specifically strokes, within Ghana's hospitals.[6] In short, hypertension prevention in Ghana would decrease mortality rates significantly, yet initiatives from the government or non-governmental organizations are lacking.

This study provides data and analysis on a more accurate cross-section of Accra, as many natives do not visit hospitals regularly. Most medical research is based on patient data in the hospital setting.

Methods

The aforementioned statistics are staggering and worsening with time. To collect additional data and raise awareness about hypertension, my study team and I traveled to Accra, Ghana, to set up a Blood Pressure Monitoring and Education center. This study team consisted of 2 nurses, a doctor, a physician's assistant (all living in Ghana), and 3 American volunteers with educational and nursing backgrounds. What follows are the results and analysis of the data collected. The research performed is anonymous human research: participants were not violated in any way, and their confidentiality was protected. The purpose of this study aimed to assess the prevalence of hypertension within Accra and determine which of the risk factors mentioned previously are responsible for the high rates of hypertension in Ghana. The data collection was held from 24 July – 31 July 2022.

Procedures:

Our cross-sectional study was conducted at four main sites in Accra: Taifa, Alogboshie, Achimota, and Pokuase. The diverse locations allowed us to capture a rough cross-section of the Accra population. At each location, an event planner set up a tent with tables and music and a custom sign that read "U.S. Blood Pressure Education and Monitoring Team " to encourage people to be screened. The people screened were people passing in the area of the site. Two paid nurses used Omron electronic sphygmomanometers to screen patients in an upright, seated position whose age, sex, family and social histories, and education level had been collected. We asked about diabetes, heart failure, and kidney problems from their family history, and we asked about marital status, education level, occupation, and smoking history for their social history. Once their blood pressure was recorded, it was written on a blood pressure log for them to keep. If the blood pressure given was not in the normal range, the nurse would retake the blood pressure and record the number closest to the normal range. Then, they took their log to a physician or physician's assistant at a nearby table for further consultation. This program was free of cost for participants. The details of each physician's appointment were private, and each participant's name and contact information were kept anonymous. The physical data for each patient has been kept in a paper binder and securely stored electronically.

Measures:

Each participant's data was recorded manually using a translator for those who did not speak English. It was then recorded electronically and sorted by blood pressure, age, sex, family history, and education level. The blood pressures were separated into stages recognized by the American Heart Association, going from "Normal" to "Prehypertension" to "Stage 1" and "Stage 2," and finally "Crisis-level."

This program was also focused on hypertension education, so information sheets from the American Heart Association were distributed to patients and translated by the team of workers and nurses for those who did not speak English.

Results and Discussion

The final sample of our study included 469 people in the marketplaces of Accra, aged 14-88. The mean age was 45 years. 73% of the participants were female, while 27% were male. Most of our participants were women because they were more willing to participate in studies than men, a common trend in Ghanaian medical studies as well as American ones. All participants were native Ghanaians, and their identities were kept anonymous.

Table 1: Levels of hypertension, separated by sex.

	Female	Male	Total
Low BP	2	1	3
Normal BP	101	34	135
Pre-hypertension	29	17	46
Stage 1 hypertension	74	33	107
Stage 2 hypertension	125	34	159
Crises level hypertension	13	6	19
Total	344	125	**469**

Sixty-one percent of the surveyed population was hypertensive. Sixty-two percent of the females had hypertension, while 58% of the males had hypertension. 4% of the participants were at crisis-level hypertension and were sent to the hospital immediately for treatment. Despite these figures, only 23% of the participants were aware of a hypertension diagnosis previous to their screening; out of this percentage, some were still not taking medication or seeking treatment. Of the individuals with crisis-level hypertension, 5 out of the 19 were unaware of any high blood pressure in their medical history (Table 1). These numbers show that Ghanaian individuals are typically unaware of their hypertensive condition. This may be due to a lack of regular blood pressure screenings among the average Accra population. Even while some are aware of their high blood pressure, many individuals told the nurses and doctors on the study team that they cannot access the few hospitals and pharmacies available or cannot afford their prescribed medications. This disconnect reported by Ghanaian healthcare workers between the medical system and the Ghanaian population is serving to maintain the current hypertension rates across the nation.

Family histories of hypertension, stroke, and diabetes were common among our population sample. Thirty percent (140/469) of our sample reported having a family member with high blood pressure. Nine percent (43/469) reported a family history of stroke, and 7% (35/469) reported a family history of diabetes. Considering the lack of awareness of hypertension in Ghana, these percentages may actually be even higher than reported. Still, the fact that 30% of our sample had a family history of high blood pressure and 61% of our sample had high blood pressure supports the fact of genetics and family history are prominent risk factors within our surveyed population.

Another trend in the data was a correlation between hypertension rates and age. Stage 2 hypertension rates were greater across the age span of 50, where they plateaued. The rates of Stage 1 hypertension stayed consistent among all age groups, remaining roughly at 24%. However, 52% of participants aged 51 through 80 had Stage 2 hypertension, while the rate was significantly lower for those aged 50 and under. There were no cases of hypertension under the age of 20 (Figure 1). Because of the spike in Stage 2 hypertension cases past 50, the most effective prevention and education initiatives would target older Ghanaians in the proper management of high blood pressure.

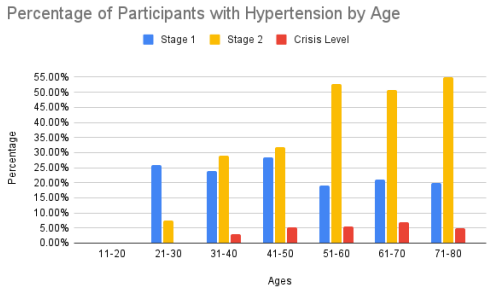

Figure 1: Percentage of participants with hypertension, separated by age.

Lack of education was another common finding in our population sample. We handed out pamphlets created by the American Heart Association but quickly realized they needed to be more effective. Of the 469 participants, 406 provided data on their education level. Of these people, 39, about 10%, had tertiary-level education. Notably, 71% of our sample had yet to make it to high school, and 10% had no formal education at all (Figure 2). As a result, if the average person in our population pool were told that they had high blood pressure, they would still need to understand its significance and know the necessary actions needed to counteract their hypertension.

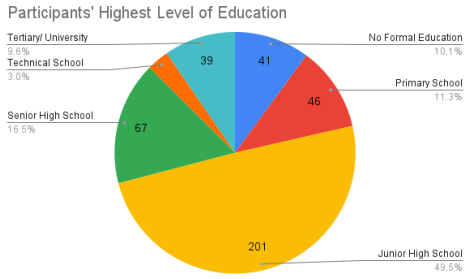

Figure 2: Participants' highest level of education.

Lower levels of education, a social determinant of health, are linked to lower incomes. In 2022, the average Ghanaian's yearly salary was reported to be 60,340 Ghanaian cedis (GHC), equivalent to 5915 U.S. Dollars.[7] Education on inexpensive hypertension prevention methods and treatment options may be effective in targeting the Ghanaian population due to its lower cost for patients.

Strengths and Limitations:

While many studies have been conducted to assess the prevalence of hypertension in urban areas of Ghana, data is often extracted by hospitals, leading to distortions because of low access to healthcare by the broader Ghanaian population. While our survey followed the general trend of hypertension within the Ghanaian population, our sample size was small and focused on those in the marketplaces of Accra. Still, this study was meaningful by allowing anyone in the area to be screened free of charge and capture the statistics of the low-income population.

Conclusion

The findings of this paper suggest that the prevalence of hypertension in the urban areas of Accra is high. The Ghanaian population is at high risk for hypertension due to patterns of high chronic disease prevalence in family histories, low awareness rates, and low healthcare affordability.

Furthermore, education levels could be higher, often below the high school level. Education on heart health would need to be elementary and taught in Twi (the local and native language amongst most Ghanaians) for the highest effectiveness. Preventative measures to stop medical emergencies from happening include education on lifestyle modification and blood pressure screenings. It is likely that this strategy would be most effective in saving lives due to Ghana's low availability of critical care.

Risk factors not addressed in this study, such as diet, obesity rates, and alcohol consumption, still contribute to Ghana's hypertension levels. Therefore, prevention methods could be focused on education about these factors. With further aid from organizations with educational resources, Ghana's hypertension rates could significantly decrease.

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Author

Nana Kyei is a senior at Western Reserve Academy. Her parents were raised in Ghana before moving to Ohio, where Nana was born. Her public health interest grew from visits to Ghana, where she witnessed a lack of medical resources, and she aspires to be a physician in the future.