A cross-sectional study into the expression of financial challenges as expressed by ambulant hypertensive patients in Ghana

Author Information

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## Introduction

Most of the cardiovascular morbidities worldwide are caused by hypertension or high blood pressure [@curado2021; @Mahmood2020; @Mills2020; @Treciokiene] and almost a billion people in the world have hypertension @Treciokiene. Demographic characteristics, particularly age and educational level, have been identified as the major risk factors for developing high blood pressure [@Khan2021]; @Matei2018]. There is a strong bi-directional correlation between poverty and Non-Communicable Diseases (NCDs) [@WHO2017; @Oh2022; @Brummette2019; @Wang2021] as NCDs pose serious threats to the financial stability of individuals and their families @Adane.

Direct medical cost is the biggest cost component for patients seeking healthcare for hypertension @Adane2020. Drug expenditure, of the total direct expenditure, are responsible for an increasing proportion of health costs, accounting for United States Dollars (USD) 1.1 trillion in annual expenditure worldwide @Athanasakis2017. Among NCD sufferers, it has been documented that hypertensive patients particularly have a higher cost burden compared to non-hypertensive patients [@Wang2021; @zhang2020; @Valero-Elizondo2016;]. The presence of a co-morbidity further exacerbates costs associated with the management of hypertension @Zhang2020. Among several factors, patient behaviors, such as adherence to treatment strongly affect healthcare expenditure due to hypertension @Petersen2021. Patients who had financial difficulties were also less likely to honor scheduled clinic visits @Godpower2021.

In Australia, Out-of-pocket payment (OOP) alone is estimated to cost patients 941 million Australian dollar (AUS) per annum @Adams2020. A study in Columbia estimated the direct cost of hypertension care to cost households $12,255.59 per annum @Londono2020. In Ethiopia, Sorato (2022) estimated the total direct cost to patients to be USD 64,837.48 @Sorato2022.

It is no surprise therefore that there have been several attempts worldwide to identify the ideal cost mechanisms to reduce the burden on hypertensive patients and the healthcare system in general[@Jay2021; @Wright2022; @Treciokiene2021; @Hannan; @oti2016]. The detection, treatment, and control of hypertension have been described as poor in Sub-Saharan Africa (SSA)[@Cappuccio2016; @Athanasakis2017; @Mills2020]. A global analysis of the situation by @Margan2017 revealed huge disparities in the accessibility and affordability of HBP control medications. Residents in the upper income countries had access and could afford 2 or more drug classes thereby having optimal clinical outcomes compared to residents in lower income countries who had lesser access to BP medications and could not often affor their BPs. Hence, the blood pressure of residents in LMICs were often poorly controlled.

Hypertension is estimated to affect 13% of Ghanaians @Olutobi2018. Even though, the National Health Insurance Scheme (NHIS) provides financial cost protection for most people, particularly children and people with chronic diseases through the Ghana-Diagnostic Related Grouping (G-DRG) payment mechanism to hospitals, a good number of Ghanaians have still not subscribed [@Sarkodie2021; @Olutibi2018] owing principally to affordability @Kusi2015 and a poor understanding of social health insurance [@Kusi2015; @KontoAgnes2017]. Again, not all HBP medications are covered by the NHIS. In other instances too, the amount reimbursable is lower than the market price of the drugs @Harisson2021. These factors often lead to catastrophic and impoverishing health expenditure for non-subscribers. That notwithstanding, the NHIS subscribers are not spared OOP while seeking health care. The NHIS has been shown to be inadequate in providing financial protections for subscribers [@De-Graft2014; @Sarkodie2021] and OOP is still high among subscribers, sometimes paying fully @AduSarkodie2021. Frequent drug stock-outs @Olutibi2018 and delayed reimbursement to providers [@CitiFM2022; @AgyepongIrene] have resulted in situations where patients have to either buy their drugs from private pharmacies or make partial or full payments for services at the hospital @Olutibi2018.

Poor households are often not able to afford their medications and given that access and affordability to HBP medications is linked to clinical outcome, it is important the financial burden experienced by hypertensive patients is examined critically in Ghana and other LMICs. A study in Accra, Ghana, revealed 19.4% OOP rate among hypertensive patients while acquiring their drugs. As much as 40% could not afford their medication when they went to a private pharmacy to acquire their drugs and a further 25.3% could not afford their drugs at the hospital’s pharmacy @Harrison. This study examines the expression of financial difficulties or otherwise of hypertensive patients in 4 public hospitals in Kumasi and the patient characteristics associated with the experience of financial difficulties in accessing healthcare.

## Methodology

The patients were attending routine medical care and were recruited as part of the uHype study. The patients were asked as part of the questionnaire whether they experienced financial challenges accessing medical care including drugs and laboratory. Patient characteristics such as age and the presence of co-morbidities were recorded.

Ethical approval for the study was obtained from the Ghana Health service and the ethical board of the Kwame Nkrumah University of Science and Technology. A prior approval was obtained separately from each hospital before data collection began. Data collection assistants were trained and supervised to collect data using a REDCap @redcap server. All patients were consented before data collection began.

Data entry assistants were recruited and trained on the use of REDCap for data entry. The data entry assistants under the supervision of the team collected the data into the server.

### Statistical analysis

After the data collection, the data was exported to R where statistical analyses were performed. All packages used are cited in the references. The outcome variables for the study were derived from 3 related questions. One question elicited from patients whether they have financial difficulties attending the hospital for routine care. The other 2 questions asked whether there was a financial difficulty acquiring medications or laboratory services.

We built a logistic regression model with the outcome predictor being the expression of financial difficulties as a result of the HBP. We used 450 patient records to build the regression model. We started with the null model added variables and interactions until such a time the model Akaike information criterion AIC) did not significantly change. Once a model was obtained, we used it to predict the outcome for the remaining 36 patients. These steps were repeated until the model successfully predicted the outcome for all 36 patient.

## Results

### Characteristics of patients

There were 486 patients recruited into the study. The study participants were recruited from 4 sites in the Kumasi metropolis ([Table 1](#tbl-dem)). Most (221 (45.5%)) were from the Komfo Anokye Teaching hospital. The median (IQR) age of the study participants was 62 (53.0, 70). There were more females than males in the study [360 (74.1%)]. Only 29 (6.0%) had had a tertiary education and only a further 22 (4.5%) had had post secondary/high school education. The majority of the patient, 219 (45.2%), had primary to junior high school education. The rest had had no formal education or had not completed primary education [154 (31.8%)]. Most, 281 (57.8%), of the patients had partner (married or cohabiting). Of the NA that were engaged in an occupational activity, most of them, 191 (82.3%), were engaged in informal employment. For those that were not working, 138 (54.5%) attributed the situation to ill-health, 77 (30.4%) were on retirement and 38 (15.0%) had other non-specific reasons. Almost all of the patients, 483 (99.8%), had an insurance coverage the majority [479 (98.6%)] of whom were NHIS subscribers. Very few [3 (0.6%)] of the patients had a private insurance scheme, of whom 2 were NHIS subscribers already. The only person that had and employee paid program also had an NHIS subscription. Most [281 (57.8%)] of the patients knew at least one other family member that also had HBP, [51 (10.5%)]

Only 102 (21.0%) of the participants checked their BPs using a device they own or had access to in the house while a paltry 46 (9.5%) visited a neighborhood health facility to check their BPs and a further 30 (6.2%) visited pharmachy shops to check their BPs. Only 11 (2.3%) patients indicated they check their BPs with street vendors who carry BP apparatuses around to check for people.

Table 1: Demographic characteristics of patients

| **Characteristic** | **N = 486**1 |
| --- | --- |
| Site |  |
| Ejisu Gov't Hospital | 62 (12.8%) |
| Komfo Anokye Teaching Hospital | 221 (45.5%) |
| Kumasi South Hospital | 102 (21.0%) |
| Tech Hospital | 101 (20.8%) |
| Age | 62 (53.0, 70) |
| Sex |  |
| Female | 360 (74.1%) |
| Male | 126 (25.9%) |
| Highest education |  |
| None or did not complete primary | 154 (31.8%) |
| Primary school and JHS | 219 (45.2%) |
| Senior/Technical/Vocation/Middle school | 60 (12.4%) |
| Post-secondary Certificate or Diploma | 22 (4.5%) |
| Tertiary | 29 (6.0%) |
| Marital Status |  |
| Single | 205 (42.2%) |
| Partnership | 281 (57.8%) |
| Do you work |  |
| Yes | 234 (48.1%) |
| No | 252 (51.9%) |
| Type of work |  |
| Formal sector | 41 (17.7%) |
| Informal sector | 191 (82.3%) |
| Reason for not working |  |
| Retired | 77 (30.4%) |
| Ill-health | 138 (54.5%) |
| Other | 38 (15.0%) |
| Health insurance |  |
| Yes | 483 (99.8%) |
| No | 1 (0.2%) |
| NHIS |  |
| No | 7 (1.4%) |
| Yes | 479 (98.6%) |
| Private insurance |  |
| No | 483 (99.4%) |
| Yes | 3 (0.6%) |
| Employer-paid program |  |
| No | 485 (99.8%) |
| Yes | 1 (0.2%) |
| Other |  |
| No | 486 (100.0%) |
| Yes | 0 (0.0%) |
| Family history |  |
| No | 154 (31.7%) |
| Yes | 281 (57.8%) |
| No idea | 51 (10.5%) |
| BP machine at home |  |
| No | 384 (79.0%) |
| Yes | 102 (21.0%) |
| Neighborhood facility |  |
| No | 440 (90.5%) |
| Yes | 46 (9.5%) |
| Pharmacy shop |  |
| No | 456 (93.8%) |
| Yes | 30 (6.2%) |
| Street vendors with BP apparatus |  |
| No | 475 (97.7%) |
| Yes | 11 (2.3%) |
| 1 n (%); Median (IQR) |  |

### General risks and exposures

Most of the patients visited 1 (min = 1, max = 5) for their healthcare needs of which 1 (min = 1, max = 5) provided the patients with their BP medications ([Table 2](#tbl-rex)). Patients traveled 30 (20, 60) minutes to the hospital to attend the facilities for BP management. At the time of the visit, 277 (57%) had not taken their medications but 189 (39%) had taken all their medications before visiting the clinic. When asked how often they saw the same doctor, 203 (42%) replied they never saw the same doctor, 55 (11%) said they saw the same doctor sometimes and only 42 (8.7%) replied they saw the same doctor all the time. Most of the patients [352 (72%)] said they visited special HPT clinics for their healthcare but 37 (7.6%) were not aware whether they visited special clinics or not. Medications stock outs were infrequent among the patients: 354 (73%) indicated they never run out of drugs and not more than 50 patients indicated they run out often or all the time. Few, 43 (8.9%), patients expressed concerns with the drugs. Not many [145 (30%)] patients had consulted a dietitian for their BP control and a paltry 25 (18%) patients were on a special diet for BP control. Only 186 (39%) checked their BP in between visits and the median (IQR) number of times the patients checked their BP in between scheduled visits were 3 (2, 7). Compliance with scheduled appointment was very high, 384 (79%) and not more than 30 patients indicated some level of a high frequency of missing appointments. When the patients were asked about their perceived state of health, the majority of the patients indicated their health was between good to excellent with just about 20% indicating their health was either fair or poor. Notably, 97 (20%) of the patients utilized herbal medications. On comparison of their current health with their health a year ago, about 200 of them expressed sentiments suggesting it was better. About a third of them suggested their perception of health was same compared to a year ago. For about 70% of the patients, their perceived perception was worse compared to a year ago.

Only 4 (0.8%) patients that did not have an existing comorbidity, the majority, 387 (80%) had a comorbidity. A further 76 (16%) had 2 co-morbidities and 19 (3.9%) had more than 2 comorbidities. Of the comorbidites identified. Of the comobidities identified, 227 (47%) of the patients had a comorbidity that high a high risk of a cardio-vascular accident in patients (diabetes, stroke, chronic kidney failure and heart failure). Most, 374 (77%) the patients were on more than 2 medications for their hypertension management, 92 (19%) were on exactly 2 medications and 20 (4.1%) were on a single medication for the BP control. Of the total number of patients interviewed, 118 (24%) had been admitted in a hospital within the last year on accounts of high blood pressure.

Table 2: General Financial risks and exposures

| **Characteristic** | **N = 486**1 |
| --- | --- |
| Number of facilities used for healthcare | 1 (min = 1, max = 5) |
| Facilities providing BP meds | 1 (min = 1, max = 5) |
| Time to facility(minutes) | 30 (20, 60) |
| Took medications today |  |
| Yes (All of them) | 189 (39%) |
| Yes (Some of them) | 20 (4.1%) |
| No | 277 (57%) |
| Same doctor |  |
| Never | 203 (42%) |
| Few times | 129 (27%) |
| Sometimes | 55 (11%) |
| Most times | 55 (11%) |
| All times | 42 (8.7%) |
| Special clinics |  |
| Yes | 352 (72%) |
| No | 97 (20%) |
| I don't know | 37 (7.6%) |
| Stock outs |  |
| Never | 354 (73%) |
| Few times | 81 (17%) |
| Sometimes | 28 (5.8%) |
| Most times | 15 (3.1%) |
| All times | 6 (1.2%) |
| Concerns about drugs | 43 (8.9%) |
| Dieticiand for BP control | 145 (30%) |
| Special diet for BP control | 25 (18%) |
| Measure BP between visits | 186 (39%) |
| BP checks in a month | 3 (2, 7) |
| Missed appointments |  |
| Never | 384 (79%) |
| Few times | 76 (16%) |
| Sometimes | 19 (3.9%) |
| Most times | 6 (1.2%) |
| All times | 1 (0.2%) |
| State of health |  |
| Excellent | 9 (1.9%) |
| Very Good | 117 (24%) |
| Good | 264 (54%) |
| Fair | 79 (16%) |
| Poor | 17 (3.5%) |
| Herbal Medications | 97 (20%) |
| State of health a year ago |  |
| Much better now than one year ago | 118 (25%) |
| Somewhat better now than one year ago | 84 (18%) |
| About the same | 150 (31%) |
| Somewhat worse now than one year ago | 124 (26%) |
| Much worse than one year ago | 4 (0.8%) |
| Presence of a comorbidity |  |
| None | 4 (0.8%) |
| One | 387 (80%) |
| Two | 76 (16%) |
| More than 2 | 19 (3.9%) |
| HBP related morbidities | 227 (47%) |
| Multi-drug treatment |  |
| One | 20 (4.1%) |
| Two | 92 (19%) |
| More than 2 | 374 (77%) |
| Admission due to HBP | 118 (24%) |
| 1 Median (min = Minimum, max = Maximum); Median (IQR); n (%) |  |