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Prevalence of Herbal Medicine Use Among Hypertensive Patients Attending a District Hospital in Ghana

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Abstract: ***Background: Hypertension cases continue to increase both in numbers and their impact upon the quality of life of the affected individuals. A major hindrance to achieving blood pressure control in hypertension is non-adherence to medication. A key factor for poor adherence is the lack of confidence in therapy, and this is expressed sometimes through self-medication with herbal medicines and over-the-counter medicines. The study assessed the prevalence of herbal medicine use among hypertensive patients accessing care at the Outpatient Department of Asamankese Government Hospital. Methods: The study design is a cross-sectional descriptive study. The study was conducted in the outpatient department of Asamankese Government Hospital in the West Akim Municipality of the Eastern Region of Ghana. Participants recruited for the study were hypertensive patients aged 18 years or older who attended the study facility during the study period and provided informed consent. Participants were systematically recruited from all hypertensive patients visiting the Outpatients Department of the study facility by selecting every third patient who came to the pharmacy to take their medications. Results: A very high proportion of participants (90.1%) had at some point used herbal medicine for a health condition. A significant proportion (41.3%) of the participants were found still using herbal products at the time of this study. Most participants (85.1%) who used herbal medicine did so because they were seeking a cure. A very high proportion (86%) had not disclosed their use of herbal medicine to their healthcare providers. Conclusion: The prevalence of herbal medicine use among hypertensive patients receiving care from the outpatient department of the facility was found to be high, with the reason for use being a search for a cure. Herbal medicine use largely remained undisclosed to healthcare providers.***

Keywords: Hypertensive, Herbal Medicine, Prevalence, Healthcare Providers

Nomenclature:
IRB: Institutional Review Board
OPD: Outpatient Department

I. INTRODUCTION

Hypertension cases continue to increase both in numbers and their impact upon the quality of life of the affected individuals.

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Globally, an estimated 1.28 billion people aged between 30 and 79 years have hypertension, with about two-thirds living in low to middle-income countries. Among adults with hypertension, only 21% have their hypertension under control [1]. In Ghana, among persons aged 30 to 70 years, the estimated prevalence of premature death due to non-communicable diseases is 21% [2].

One area that is gaining popularity among chronically ill patients is the use of herbal medicine for the management of these chronic diseases, and this is probably due to the increase in the prevalence of chronic diseases and their complications [3,4].

Some patients prefer the use of herbal medicine for the management of their chronic conditions [5] and their use is quite common in older adults, especially those with health problems [6,7]. This has been compounded by the frequent adverts for herbal medicines in both print and electronic media [8].

Herbal medicine use can be through recommendations from close relatives, friends, other lay people, personal preference, and sometimes even health professionals [9]. The use of complementary and alternative medicine to self-manage chronic diseases such as hypertension has increased in recent years [10].

In Sub-Saharan Africa, more than one-third of adults with hypertension use traditional herbal medicine, and half of these patients use the traditional herbal medicine concurrently with allopathic medicines [11] with nearly a quarter of hypertensive adults using the herbal medicine for their hypertension [12]. A significant proportion use the herbal medicine for preventing or treating other illnesses [13].

People use herbal medicines for various reasons, including their perceived naturalness, easy accessibility and availability, lower cost, lack of faith in orthodox medicines, and few or minimal side effects. Other reasons that are ascribed to the use of herbal medicines are delays at the hospital, ineffective Western medicine and people wanting to have some control over their treatment decisions [14-18]. Others also use herbal medicines because of a desire for a complete cure and family pressure [12, 19]. It is worth noting that some people also stay away from herbal medicines [20-23].

An important goal of therapy in hypertension management is to achieve blood pressure control to prevent complications because of organ damage. A major hindrance to achieving blood pressure control in hypertension is non-adherence to medication, and this has been acknowledged by both healthcare providers and the patients themselves [24].

A key factor for non-adherence is the lack of confidence in therapy, which can be expressed through self-medication with herbal medicines and over-the-counter medicines [25]. Some studies have identified the use of herbal medicine in hypertensives, among other reasons, such as depression, formal education and concern about hypertensive medications, as a cause of non-adherence to medication [26].

Consulting with physicians does not prevent co-administration of herbal and orthodox medicines [27]. Herbal medicine use among hypertensive patients is high, but with a very low rate of disclosure to their healthcare providers [28]. This non-disclosure creates a gap of potential risk and benefits, which has serious implications, especially among the aged, who usually are the people with chronic diseases [7, 29]. Reasons for the non-disclosure to healthcare providers include the scepticism with which healthcare providers approach the issue of herbal medicine use, irrespective of its widespread usage over many centuries [30, 31].

Healthcare providers treating patients with hypertension must be aware of their use of herbal medicine. This will enable them to offer the appropriate counselling and advice to optimize the patient's therapy [13, 32, 33]. Healthcare providers, in their bid to offer effective patient-focused care to the hypertensive clients, must acknowledge that their patients may be receiving advice and treatment from other sources, which is likely to influence their knowledge, understanding and most importantly, the management of their illness [34].

Healthcare providers can improve disclosure rates by asking questions about the use of all types of complementary and alternative medicines [29] and if healthcare professionals specifically asked about herbal medicine use by the patients, it will help minimise drug–herbal medicine interactions [31].

Knowing the prevalence of herbal medicine use among hypertensive patients will also draw attention to the possible concurrent use of conventional/orthodox and herbal medicine [8, 32, 35]. Using them concurrently carries some potential risks and benefits [32, 35] from potential therapeutic interactions between the conventional medications and herbal medications. These interactions include altered drug metabolism, loss of hypertension control and exaggerated hypotension effects [8, 32, 35].

Healthcare professionals, aware of the situation, position themselves to offer much-needed counselling to help their clients make the right choices to improve their health and prevent adverse events [6, 13, 32]. It is believed that this concomitant use has two effects. The first being its effect on patient adherence to conventional therapy, and the second being possible drug-herbal medicine interactions that might affect the effectiveness of antihypertensives. This study evaluated the prevalence of herbal medicine use among hypertensive patients attending Asamankese Government Hospital.

II. OBJECTIVES

The objectives of the study are as follows:

1. To assess if the patients have ever used herbal medicines for their hypertension or any other condition.
2. To find out if patients are still using the herbal medicines.
3. To investigate the reasons that convinced the patients to use the herbal medicine for their hypertension.

III. MATERIAL AND METHODS

Study Design

The design that was employed for the study was a cross-sectional descriptive survey.

Setting

The study was conducted at the Asamankese Government Hospital, a primary care facility in the West Akim Municipality. The hospital offers general outpatient and inpatient services, as well as certain specialised services. The hospital also offers herbal medicine services.

Study Population

The study population were hypertensive patients receiving care at the Outpatient Department (OPD) of Asamankese Government Hospital.

Inclusion Criteria: Participants recruited into the study were aged 18 years or older, diagnosed with hypertension and receiving antihypertensive medications at the study facility during the study period, 26th June 2023 to 25th July 2023, and provided informed consent to be part of the study.

Exclusion Criteria: All newly diagnosed and/or admitted hypertensive patients were excluded from the study.

Data Collection

The data collection technique used was the administration of a structured questionnaire to study participants.

Sampling and Sample Size Calculation

Recruitment into the study was done using systematic sampling. This was done by recruiting every third hypertensive patient who came to the pharmacy to take their medications.

The study sample size was estimated using a 5% margin of error at a 95% confidence level. The formula below was used:

$n = \{Z^2_{\alpha/2} \text{ X } P(1-P)/d^2\} \text{ X deff}$ …….[36]

Where n=Sample size, z= z statistics for a confidence level of 95%, p=expected prevalence (coverage) or proportion, deff = design effect and d=precision or margin of error

Using a prevalence of 12.6%, a margin of error of 5%, and a design effect of 2%, the total sample size of patients with hypertension was 338, which was increased by 10% and rounded up to 372 patients.

A. Data Processing and Analysis

The data collected was entered into SPSS and cleaned. It was then analyzed using the same software. It was ensured that the analysis accounted for all the respondents enrolled in the study. The information was summarized using frequency tables, and proportions.

B. Ethical Consideration

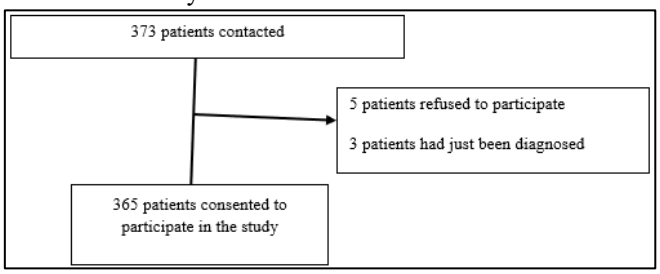
Permission was sought from the management of Asamankese Government Hospital to proceed with the data collection in the hospital.

Ethical clearance was sought from the Noguchi Memorial Institute for Medical Research's Institutional Review Board (IRB). The reference number of the ethical clearance letter of approval is NMIMR-IRB CPN 078/22-23.

Written informed consent was sought from all participants after briefing them on the study and assuring them of confidentiality.

IV. RESULTS

The data collection started on the 26th June, 2023 and ended on the 25th July, 2023, thus a period of one month. A total of three hundred and seventy-three (373) patients were contacted for recruitment into the study. Five (5) patients refused to participate in the study, whilst three (3) could not participate because they were newly diagnosed; thus, they had been diagnosed with hypertension and started on treatment the same day they were contacted for participation in the study. Three hundred and sixty-five (365) consented to participate in the study. Results for 365 patients were available for analysis.



[Fig.1: A Chart Depicting the Recruitment of Study Participants]

A. Sociodemographic Characteristics of Respondents

Participants' ages were grouped into age bands. The results showed that the highest-ranked age band of participants was 61 years – 70 years, with a proportion of 34.1%, followed by 51 years – 60 years with 23.3% and 71 years – 80 years with 19.7%, as shown in Table 1.

It was also observed that the majority of the participants were females with a percentage of 83.0% whiles males were 17.0% as depicted in Table 1 below

A greater percentage of the study participants (51.5%) were from urban communities, with 48.5% living in rural communities within the health facility's catchment area. This is shown in Table 1 below.

Table I: Distribution of Age and Sex of participants

Age Of Participants (Years)	No. (%)
18 – 30	5 (1.4)
31 – 40	13 (3.6)
41 – 50	32 (8.8)
51 – 60	85 (23.3)
61 – 70	125 (34.2)
71 – 80	72 (19.7)
Above 80	33 (9.0)
Total	**365 (100)**
SEX	**No. (%)**
Male	62 (17.0)
Female	303 (83.0)
Total	**365 (100)**
Community	**No. (%)**
Urban	188(51.5)
Rural	177(48.5)
Total	**365(100)**

B. Assess if the Participants Have Ever used Herbal Medicine for Their Hypertension or any Other Condition.

A very high proportion of participants (90.1%) had at some point used herbal medicine for a health condition, while 9.9% had never used it. Among participants who had ever used herbal medicines, 32.1% of the participants used herbal medicine for hypertension and hypertension with other co-morbidities, as depicted in Table II.

Table II: Participants who Have Ever used Herbal Medicines and Conditions for Use

Ever Used Herbal Medicine	No. (%)
Yes	329 (90.1)
No	36 (9.9)
Total	**365 (100)**
Condition: Herbal Medicine Was Used For	**No. (%)**
Hypertension	85 (23.3)
Malaria	50 (13.7
Stomach Pain/Peptic Ulcer/Stomachache	34 (9.3)
Hypertension with other comorbidities	32 (8.8)
Fever	29 (7.9)
Stroke	24 (6.6)
Musculoskeletal Pain	22 (6.0)
Immune Booster	12 (3.3)
Typhoid Fever	5 (1.4)
Piles	3 (0.8)
Others	33 (9.0)
Not Applicable	36 (9.9)
Total	**365 (100)**

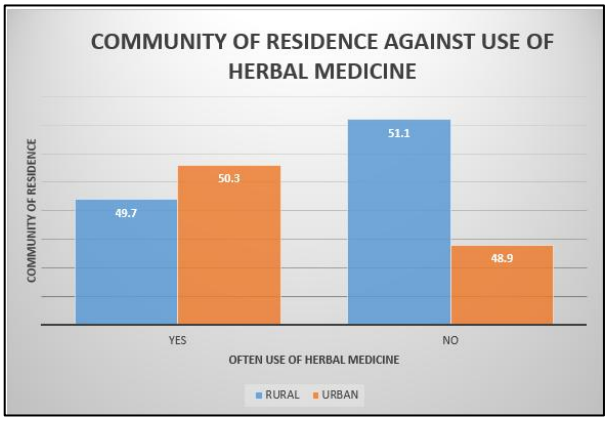
C. Find Out if Patients are Still Using Herbal Medicines

A very significant proportion (41.3%) were still using herbal medicine at the time of data collection. Out of the 41.3% who were still using herbal medicines at the time of data collection, 47.8% of them used the herbal medicine for their hypertension and hypertension with other comorbidities, 11.8% (16) of them used the herbal medicine for fever, with 8.0% using it for stroke, as shown below in Table III.

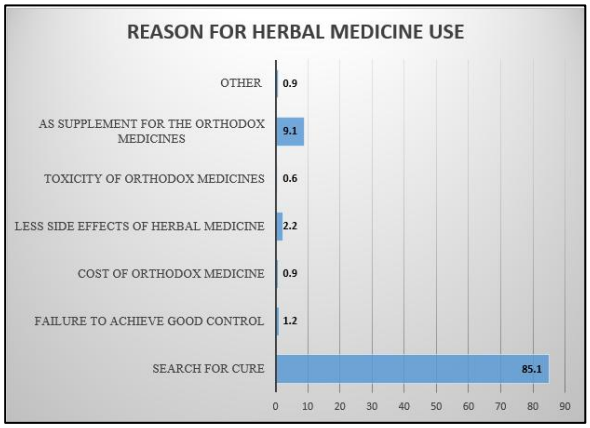
Table III: Current use of Herbal Medicine and Current Condition for use by Participants

Current Use of Herbal Medicine	No. (%)
Yes	136 (41.3)
No	193 (58.7)
Total	**329 (100)**
Current Condition for Herbal Medicine Use	**No. (%)**
Hypertension	49 (36.0)
Hypertension with other comorbidities	16 (11.8)
Fever	16 (11.8)
Malaria	15 (11.0)
Stroke	11 (8.0)
Stomach Pain/Peptic Ulcer /Stomachache	10 (7.4)
Musculoskeletal Pain	8 (5.9)
Immune Booster	4 (2.9)
Typhoid Fever	2 (1.5)
Others	5 (3.7)
Total	**136 (100)**

A cross-tabulation of the participants' community of residence against frequent use of herbal medicine revealed a slight difference. It was observed that 50.3% of urban dwellers used herbal medicine often, as compared to 49.7% of rural dwellers who said they used herbal medicine often, as illustrated in Figure 2



[Fig.2: Community of Residence and the Use of Herbal Medicine]



[Fig.3: Illustration of the Reason for Using Herbal Medicine by Participants for their Hypertension Alone or Hypertension with Other Comorbidities]

D. Investigate the Reason that Convinced the Patients to Use Herbal Medicines for Their Hypertension

The majority of participants (85.1%) who had used herbal medicine in recent times for any condition did so to seek a cure. 9.1% of the participants also used the herbal medicine as a supplement to orthodox medicine, while 2.2% used it because they believed it had fewer side effects. This is shown in Figure 3 below.

The data also showed that the majority of participants (86.0%) had not informed their healthcare providers of their use of herbal medicine, regardless of the condition for which it was used. Out of the 86.0% who had not informed their healthcare providers about their use of herbal medicine, 68.2% said they had not informed their healthcare provider because they had never asked about their use of herbal medicine, 11.3% felt there was no need, and 8.8% had no reason, as seen in Table IV below.

Table IV: Informed Healthcare Provider About Herbal Medicine use and Reason for not Informing Healthcare Provider

Informed the Healthcare Provider About the Use of Herbal Medicine	**No. (%)**
Yes	46 (14.0)
No	283 (86.0)
Total	**329 (100)**
Reason For Not Informing Healthcare Provider About Herbal Medicine Use	**No. (%)**
The provider never asked	193 (68.2)
Felt there was no need	32 (11.3)
Felt using herbal medicine is normal	7 (2.5)
Fear of insults/annoyance from healthcare providers	13 (4.6)
Did not know they had to tell	11 (3.9)
No reason	25 (8.8)
It was not helpful	2 (0.7)
Total	**283 (100)**

V. DISCUSSION

This study assessed the prevalence of herbal medicine use among hypertensive patients attending the outpatient department at Asamankese Government Hospital.

The specific objectives of this study were to assess whether patients have ever used herbal medicines for hypertension or any other condition, and to determine whether they are still using them. The study also investigated the reasons that convinced the patients to use the herbal medicine for their hypertension and to determine if patients who use herbal medicines for their hypertension use them together with their orthodox medicines.

A high proportion (90.1%) of the participants had used herbal medicine for their hypertension and other conditions. This finding is similar to other studies reporting that 80% of people in Africa rely on herbal medicine as their primary form of therapy [19, 25].

The high use of herbal medicine among these patients could be due to several factors, including the perception that it is part of Ghanaian culture, where one does not necessarily have to be sick to receive it. It is also less expensive, readily available and readily accessible.

Though there was a very high prevalence of ever using herbal medicine, its use was not only for just the hypertension but for hypertension and a lot of other conditions, such as malaria, stomach pain/peptic ulcer, musculoskeletal pain, Typhoid fever and many others.

It is worth mentioning that though the hypertensive patients were using herbal medicine for many conditions, its use for hypertension and hypertension with other co-morbidities was 32.1%, which is high. This is similar to other studies that identified the use of herbal medicine for hypertension in around a quarter to a third of their participants [11, 12].

An analysis of the community of residence against the use of herbal medicine showed a slightly higher tendency to use herbal medicine among participants living in Urban communities (50.3%) compared with those from Rural communities (49.7%).

This finding was contrary to observations in other studies, which found that although herbal medicine use was widespread in both urban and rural settings, the prevalence was slightly higher in rural settings [37, 8, 38].

This observation in this study could be due to the increased promotion and advertising of herbal medicines in both print and electronic media, including social media, which are readily available resources for people in urban areas. Promotions and advertisements are also being carried out on public transport and at information centres at the lorry station. Furthermore, it could also be because participants from Urban communities (51.5%) were slightly higher than participants from rural communities (48.5%)

A significant proportion (41.3%) of participants who had ever used herbal medicine were still using it at the time of the study. This implies that the participants who were currently using herbal medicine were using it alongside their orthodox medicines, and having access to mainstream/formal healthcare services was not a deterrent to the use of herbal medicines. This agrees with other studies that half of hypertensive patients use herbal medicines alongside allopathic medicines, and consulting with a physician does not deter patients from using herbal medicine alongside allopathic medicines [11,27].

Using the medicines concurrently presents challenges, including drug–herbal interactions that could affect the pharmacokinetics or pharmacodynamics of the orthodox medicines and reduce efficacy and effectiveness, as well as the possibility of toxicity from systemic interactions.

All these interactions may lead to failure to achieve the therapeutic goals for the use of orthodox medicine, either because of decreased effectiveness of the medication or due to toxicity. The result will be inadequate adherence to therapy, which is a major cause of not achieving targeted blood pressure control in hypertensive patients. [24,25].

This observation could be happening because the hypertensive patients have inadequate knowledge of drug–herbal interactions. Healthcare workers must appreciate the fact that there is a high tendency for hypertensive patients to use herbal medicines concurrently with their orthodox medicine, hence they should make a conscious effort to ask appropriate questions on herbal medicine use for effective education of the patients. In my opinion, this will help achieve better therapeutic outcomes for our hypertensive patients. Patients must be empowered with the right information to make informed decisions.

About 85.1% of participants who used herbal medicine for any condition said they did so to seek a cure, while 9.1% used it as a supplement to orthodox medicines. The reasons given by participants for their use of herbal medicine were similar to those observed in other studies. [12,19].

Search for a cure remains the single most important reason for the use of herbal medicine in patients living with hypertension. Living with a chronic condition and having to take medication for the rest of one's life remains a very difficult reality for most people to accept. The majority of people are always eager to try anything that promises them a cure for their chronic condition.

This situation reveals that healthcare providers and health promoters have a herculean task of educating people with these chronic non-communicable diseases, for people to appreciate the non-curable nature of these diseases.

The majority of the participants (86.0%) revealed that they had not informed their healthcare providers about their use of herbal medicine for their hypertension or any other condition. When they were asked for the reason why they had not informed their healthcare providers about their use of herbal medicines, the majority of them (68.2%) said they had not informed their healthcare providers because they had never asked them anything about herbal medicine use, with about 11.3% also thinking it was unnecessary to tell the healthcare providers.

Considering the potential impact of herbal medicine use on orthodox medication therapy, I believe it is important that healthcare providers make a conscious effort to explore patients' use of herbal medicine so that appropriate education and measures can be put in place to help achieve the optimal outcome of the patient's medication therapy.

James et al., in a study conducted in Sierra Leone, recommended that healthcare workers note the use of herbal medicine among hypertensive patients and routinely ask patients whether they are using it. (James et al., 2018).

A. Limitations of the study

The study had some limitations, which have been enumerated below:

i. The study did not assess the blood pressure levels of the participants; it was not able to make any inferences as to the impact of the use of the herbal medicine by the participants on their blood pressure control.

ii. Patients' adherence to drug therapy and keeping to review appointments was also not assessed; no deductions could be made about the impact of the herbal medicine use on adherence to orthodox therapy.

Notwithstanding the above limitations, the results obtained in this study provide a true reflection of the use of herbal medicine by hypertensive patients receiving care at the outpatient department of Asamankese Government Hospital.

VI. CONCLUSION

Herbal medicine use among hypertensive patients, as evidenced by this study and other studies, is significantly high and needs to be an area of concern to healthcare providers. The use of these herbal medicines may extend beyond hypertension; they may also be used for other conditions. The main reason for the use of herbal medicines by hypertensive patients was found to be a search for a cure. The use of herbal medicine concurrently with orthodox medicine could affect the effectiveness of each other in controlling high blood pressure because of herbal – drug interactions.

Healthcare providers must explore the use of herbal medicines by their hypertensive patients to be able to educate them appropriately to eliminate the possible non-adherence to therapy, leading to poor outcomes.
controlled blood pressure with
its attendant complications.

RECOMMENDATION

The following recommendations are intended to assist hospital management, the Municipal Health Administration, and all other stakeholders in providing quality healthcare to hypertensive patients who access care at their facility.

A. Healthcare providers should be encouraged to talk to their hypertensive patients about herbal medicine usage routinely.

B. Herbal medicine use and the benefits and risks associated with it should be included in the educational materials/information to be discussed with all hypertensive patients.

C. Hypertensive patients with an interest in using herbal medicines for their hypertension or any other condition should be referred to the Herbal Clinic within the hospital to see a certified Herbal Medicine Practitioner for management.

D. I propose that a study be conducted to consider the effects of concurrent herbal medicine use on blood pressure control.

E. Another study that considers adherence to therapy and review appointments among patients concurrently using herbal and orthodox medicines will be of value.

DECLARATION STATEMENT

Some of the cited references are older and are noted explicitly as [4], [7], [11], [13], [14], [15], [16], [17], [18], [19], [20], [21], [22], [23], [25], [26], [27], [30], [35] and [36]. However, these works remain significant for the current study, as they are pioneering in their fields.

After aggregating input from all authors, I must verify the accuracy of the following information as the article's author.

- **Conflicts of Interest/ Competing Interests:** Based on my understanding, this article has no conflicts of interest.
- **Funding Support:** This article has not been funded by any organizations or agencies. This independence ensures that the research is conducted objectively and free from external influence.
- **Ethical Approval and Consent to Participate:** Yes, securing ethical approval and consent from all participating individuals is essential. Ethical clearance or approval was sought from the Noguchi Memorial Institute for Medical Research's Institutional Review Board (IRB). The reference number of the ethical clearance letter of approval is NMIMR-IRB CPN 078/22-23. Written informed consent was sought from all participants after briefing them on the study and assuring them of confidentiality.
- **Data Access Statement and Material Availability:** The article's resources are not publicly accessible. A credential is required for data access, and a material availability statement.
- **Author's Contributions:** The authorship of this article is contributed equally to all participating individuals.

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APPENDICES

Appendix 1

CONSENT FORM

Title: **The prevalence of herbal medicine use among hypertensive patients attending the outpatient department in a district hospital in Ghana.**

Principal Investigator: Nii Obodai Mensah

Address: Asamankese Government Hospital, P. O. Box 120, Asamankese – Eastern Region.

General Information about Research

This study intends to investigate whether hypertensive patients receiving care at the outpatient department have ever used herbal medicines for their hypertension or for any condition, whether they are still using the herbal medicines, to find the reason that convinced the patient to use the herbal medicine for their hypertension and to determine if patients who use herbal medicines for their hypertension use it together with their orthodox medicines.

The findings of the study will be made available to the Hospital Management, the District Health Directorate, and all stakeholders involved in the prevention and management of hypertension, thereby helping to restructure, plan, and implement policies to improve treatment outcomes for patients with hypertension. It will also contribute to the body of knowledge on the management of hypertension. All patients managed as hypertensives in the OPD will be approached at the pharmacy after receiving their medication. They will be introduced to the study, and the questionnaire will be administered to them after they consent to participate.

Possible Risks and Discomforts

Some of the questions you may be asked may be a little uncomfortable for you, such as whether you have used any herbal medicine alongside your conventional treatment. You may be delayed for about ten (10) minutes more after receiving your medicines to answer the questionnaire.

Possible Benefits

The benefit of your participation is that you will contribute useful information to hospital management, the District Health Directorate, policymakers, and other stakeholders, which may help design and provide appropriate services to

manage hypertensive cases and prevent complications in such patients.

Confidentiality

The interviews are strictly confidential, so your responses will not be shared with anyone outside the study team.

Your name will not appear on any of my notes or any of the reports. Data collected cannot be linked to you in any way.

No name or identifier will be used in any publication or reports from this study.

Compensation

You will not receive any form of compensation, whether in cash or kind, for your participation in this study.

Additional Cost

You will not be charged for participation in this study, nor will your participation in this study impose any additional cost on you.

Voluntary Participation and Right to Leave the Research

Your participation is completely voluntary, and you may refuse to participate at any point during the discussion. You may ask me to stop the interview if it makes you feel uncomfortable, or decline to answer any single question if it does.

There will be no consequence if you choose to withdraw from the study. You will receive all necessary assistance wherever needed, and your access to quality healthcare/treatment at this hospital will not be affected.

Contacts for Additional Information

If you have any questions concerning this study, please do not hesitate to contact Nii Obodai Mensah of Pharmacy Department of Asamankese Government Hospital at any time for further information on:

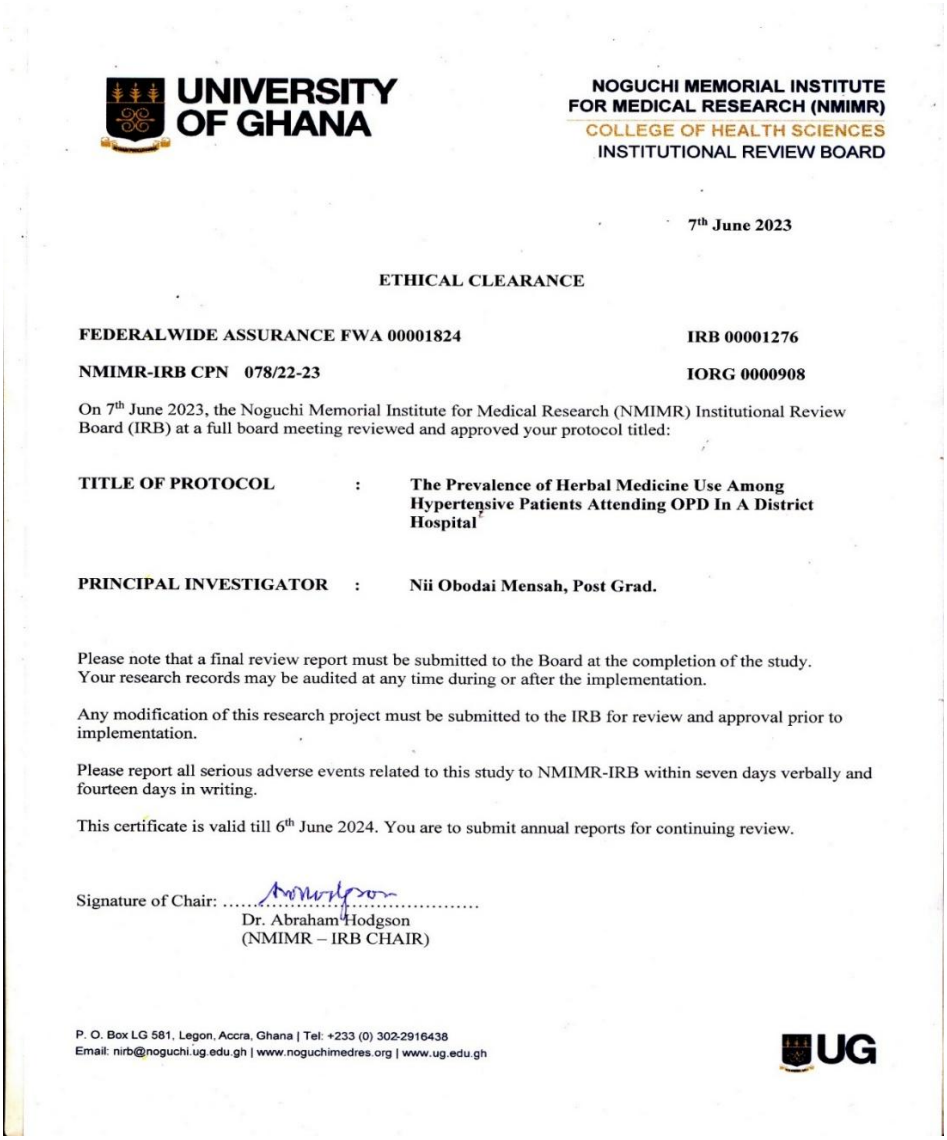
026 4598116 / 024 4598116

Your rights as a Participant

This research has been reviewed and approved by the Institutional Review Board of Noguchi Memorial Institute for Medical Research. (NMIMR-IRB). If you have If you have any questions about your rights as a research participant, you can contact the IRB Office between the hours of 8 am-5 pm through the landline 0302916438 or email addresses: nirb@noguchi.ug.edu.gh

Appendix 2

ETHICAL APPROVAL LETTER



UNIVERSITY OF GHANA

NOGUCHI MEMORIAL INSTITUTE FOR MEDICAL RESEARCH (NMIMR)
COLLEGE OF HEALTH SCIENCES
INSTITUTIONAL REVIEW BOARD

7th June 2023

ETHICAL CLEARANCE

FEDERALWIDE ASSURANCE FWA 00001824 IRB 00001276

NMIMR-IRB CPN 078/22-23 IORG 0000908

On 7th June 2023, the Noguchi Memorial Institute for Medical Research (NMIMR) Institutional Review Board (IRB) at a full board meeting reviewed and approved your protocol titled:

TITLE OF PROTOCOL : The Prevalence of Herbal Medicine Use Among Hypertensive Patients Attending OPD In A District Hospital

PRINCIPAL INVESTIGATOR : Nii Obodai Mensah, Post Grad.

Please note that a final review report must be submitted to the Board at the completion of the study. Your research records may be audited at any time during or after the implementation.

Any modification of this research project must be submitted to the IRB for review and approval prior to implementation.

Please report all serious adverse events related to this study to NMIMR-IRB within seven days verbally and fourteen days in writing.

This certificate is valid till 6th June 2024. You are to submit annual reports for continuing review.

Signature of Chair: .....
Dr. Abraham Hodgson
(NMIMR – IRB CHAIR)

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