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**Exploring the acceptability of self-screening for hypertension in private drug shops: A Qualitative evaluation of a pilot Intervention in Mwanza region, Tanzania**

**Authors:**

Kezakubi, D. National Institute for Medical Research, Mwanza, Tanzania

Juma, A. Kilimanjaro Christian Medical University College, Moshi, Tanzania

Michael, D. National Institute for Medical Research, Mwanza, Tanzania

Todd, J. London School of Hygiene and Tropical Medicine, London, UK and Kilimanjaro Christian Medical University College, Moshi, Tanzania

Reyburn, H. London School of Hygiene and Tropical Medicine, London, UK

Renju, J. London School of Hygiene and Tropical Medicine, London, UK and Kilimanjaro Christian Medical University College, Moshi, Tanzania

**Corresponding author** [jenny.renju@lshtm.ac.uk](mailto:jenny.renju@lshtm.ac.uk)

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## **Abstract**

### **Introduction**

In sub-Saharan Africa the estimated burden of hypertension is increasing. Innovative strategies are needed to ensure that people can regularly check their blood pressure. This qualitative study aimed to understand participants' knowledge of hypertension, explore the acceptability of self-screening blood pressure testing at private drug shops, and understand motivations and barriers for attending referral services after a high blood pressure reading.

### **Methods**

The study took place between October 2013 and January 2014 in Mwanza region, Tanzania. In-depth interviews were conducted with eight service providers and 14 service users. Two focus group discussions were conducted with 24 community members.

### **Results**

Private drug shop attendants liked the opportunity to offer blood pressure testing, and their clients appreciated the self-testing of their blood pressure. Some service users, whose screening suggested a raised blood pressure, attended health facilities for further follow-up. This was driven by their expectations of good services, health concerns and a desire for treatment. Conversely, a perceived lack of severity of the condition were barriers to attendance at the health facility, along with the long waiting times and drug stock-outs experienced at the facilities.

### **Conclusion**

Private drug shops provide an opportunity to acts as a gateway for more people to assess their health. However self-screening alone cannot ensure those in need of treatment receive it. A broader structural

intervention is required to remove the barriers preventing people from attending health services in order to receive adequate medical care.

**Keywords:** Drug retail outlets, Hypertension, Pharmacies, Public–private partnerships, Screening, Tanzania

## **Introduction**

Hypertension is a major risk factor for stroke. In sub-Saharan Africa, the estimated burden of hypertension was 79.8 million in 2000 and is projected to increase to 150.7 million by 2025 (Abegunde, Mathers, Adam, Ortegón, & Strong, 2007; Adeloje & Basquill, 2014; Panel, Guidelines, Group, & Council, 2011). The effects of hypertension can be prevented through early detection, effective anti-hypertensive medication and lifestyle changes. Rates of detection, treatment and control of hypertension in sub-Saharan Africa are low (Adeloje & Basquill, 2014; Ataklte et al., 2015; M. Dewhurst et al., 2013; M. J. Dewhurst & Walker, 2016; Edwards et al., 2000; Pereira, Lunet, Azevedo, & Barros, 2009). Studies conducted in Tanzania showed that approximately one-third of those found with hypertension were already aware of their condition, one-sixth of those who knew they were hypertensive were on treatment, and only one-sixth of those on treatment had adequately controlled their hypertension (M. Dewhurst et al., 2013; M. J. Dewhurst & Walker, 2016). In order to improve rates of detection and treatment, innovative ways are needed to screen more people at risk of hypertension and to improve their access to treatment services. Community-based screening by non-clinical personnel and self-screening approaches have been shown to be effective in developed countries settings (Fleming et al., 2015; Houle S, Chuck A, 2012). There have been no published studies describing such an approach in Africa.

We conducted a pilot study in Tanzania to assess the feasibility and acceptability of placing semi-automated blood pressure monitors with advanced oscillometric measurement (A&D Company limited, Model UA-767) into private drug shops (which in Tanzania include pharmacies and smaller accredited drug dispensing outlets). We also assessed the potential for linkage to referral services. The health belief model underpinned the intervention framework. This model postulates that an individuals' readiness to take action concerning their own health is based on an assessment of the seriousness or susceptibility to a given condition. This assessment is then weighed against other factors (e.g. physical and financial costs, overall acceptability of services or treatments, etc.) which affect the decision to take action (e.g. screen

and/or attend health facilities for follow-up assessments). Making blood pressure monitors available to individuals aimed to remove many physical and financial barriers to screening and provide an opportunity for them to assess the seriousness of their condition and their susceptibility to hypertension (Janz & Becker, 1984).

The pilot intervention and main findings have been reported in detail elsewhere (Michael et al., 2016); however, in brief the person in charge at each private drug shop received training on how to instruct clients to use a digital, semi-automated blood pressure machine to measure their own blood pressure. If, after two repeated measures, the self-test showed a blood pressure of over 140/90 mmHg, the client was given a slip with the name and address of the health facility and recommending they attend for a follow-up assessment. At the main government health facility in each district, a nurse was assigned to collect the slips, denoting a successful referral. During the pilot intervention, a total of 971 customers were screened and one person refused; 109 (11.2%) had blood pressure over 140/90 mmHg and were advised to attend a health facility for a blood pressure measurement; 85/109 (78.0%) of those reported to have a blood pressure over 140/90 mmHg had not been previously diagnosed with hypertension. Only 18/85 (21%) newly diagnosed participants visited the referral clinic within two weeks as advised during their visit (Michael et al., 2016). A qualitative line of enquiry was conducted alongside the feasibility study to (a) understand the participants' knowledge of hypertension and its treatment; (b) explore the providers' and users' acceptability of the self-screening technology; and (c) understand the motivations or barriers for visiting a health facility following a raised blood pressure reading during the self-screening.

## **Methods**

### *Setting*

The study was conducted in Magu and Nyamagana districts in Mwanza region, northwest Tanzania. Magu is a rural district with a population of 299,759 (National Bureau of Statistics, 2013). Nyamagana is an urban district, part of Mwanza city, with a population of 363,452 (National Bureau of Statistics, 2013).

The two districts were purposively selected to ensure representation of both urban and rural communities and accessibility from the research centre.

#### *Sampling and recruitment of participants*

We recruited three groups of participants: service providers, service users, and community members.

In each of the two districts, four service providers were interviewed about the blood pressure self-screening service provided at the private drug shops: one service provider at the referral health facility, one attendant in charge of the pharmacy, and two attendants from the smaller accredited drug dispensing outlets.. Therefore, a total of eight in-depth interviews were conducted.

Service users were stratified according to those who had normal blood pressure, those who were hypertensive and attended the referral, and those who were hypertensive but did not attend the referral. Members of the groups were assigned numbers, and random numbers were used to select 14 participants (seven in each district) for in-depth interviews about their experiences with the blood pressure self-screening services in the private drug shops. In the event of a refusal to participate, another random selection was made.

Community leaders guided us in the recruitment of an additional 24 community members (12 in each district) to participate in four focus group discussions (two in each district). The focus groups were a mix of men and women who had and had not used the self-screening service.

#### *Data collection*

Selected participants were contacted by telephone three days before the interview (with a reminder one day before), asking them if they were willing to come for further discussions regarding hypertension. The lead investigator used topic guides to conduct the in-depth interviews in a private place selected by the respondent. For service users, topic guides were developed to elicit awareness of hypertension, to ascertain current health-seeking behavior and to explore their motivation for using the blood pressure self-



screening service, how they felt using the service and any follow-up that has taken place since using the service. For service providers, topic guides investigated their experiences and understanding of hypertension and their perceptions of the views of the community concerning such a screening and referral service.

In-depth interviews and focus group discussions were conducted in Swahili and recorded digitally. The interviews and Focus group discussions were conducted in private places and usually took 20-40 minutes or between 60-80 minutes respectively. Detailed notes were written by the interviewers immediately after each interview and focus group discussion.

#### *Data management and analysis*

All recordings were transcribed and translated into English. Anonymised transcripts were imported into NVIVO version 9 software (QSR International, Doncaster, Victoria, Australia). A broad coding framework was developed based on the topic guides and following the aims of the study; namely to assess knowledge, attitudes toward hypertension, and attitudes and experiences of using or providing the blood pressure self-screening service. A grounded theory approach was applied next to a thematic analysis to enable additional themes to be identified inductively. The first-level coding was conducted by the lead investigator and then shared with the study team. The coding and themes were reviewed and discussed to ensure faithfulness to the data. Quotations illustrating the main findings were identified and used to illustrate the different themes.

#### *Ethical issues*

All participants provided written informed consent and were refunded for their transport costs. The study was approved by the Lake Zone Institutional Review Board (LZIRB) of the National Institute for Medical Research (reference number MR/53/100/104).

## **Results**

### **Awareness of and attitudes towards hypertension**

#### *Service providers*

The service providers were aware of hypertension and were able to define the condition in terms of what a blood pressure reading should be. The service providers mentioned that hypertension can be caused by depression, stress, and genetic predisposition and often affects those with a family history of hypertension. They also associated hypertension with the consumption of fatty food, obesity, being above 50 years of age, and having other diseases like diabetes and kidney diseases. They identified the symptoms of hypertension often mentioned by their clients, including severe headaches, feeling dizzy, fatigue, excessive sweating and irregular heartbeats. Service providers reported that treatment of hypertension should be available from hospitals but recognized that in reality public facilities often were inadequately stocked, forcing patients to purchase drugs from private facilities. Some service providers also recounted how some people with hypertension prefer to use traditional medicines.

#### *Service users and community members*

Stress was identified as the major cause of hypertension by service users and community members. Stress reportedly stemmed from multiple sources, for example from the death of a relative or friend, not getting what he/she expected in life, fear and family problems. Some participants mentioned poor eating habits (excessive salt, fat, sugar, coffee, husked grains), being overweight or having another disease (malaria, diabetes) as causes of hypertension. Service users and community members also mentioned various symptoms of hypertension, including frequent fainting, heart palpitations, breathing difficulties, excessive sweating, nausea, frequent urination, lethargy, and being short-tempered and forgetful.

Both modern and traditional medicines were mentioned as treatment options for hypertension, with many preferring the latter. Common traditional medicines included garlic and aloe vera. Others stated that by drinking a lot of water one could control high blood pressure. Participants felt that people only go to the hospital when they become very ill, seemingly defined as not able to move. The main reason cited for the perceived aversion to hospital medication was the belief that western medication causes the disease to get worse. Some stated that western medicines are toxins, hence the preference for traditional medicines.

*Sometimes people believe that if you start using these medicines you will get problems. The treatment may increase the problem, and you may develop other diseases [...] so they think it is better to use traditional medicines [...] in kisukuma they call **chembamoyo** so they believe traditional medicine can cure better than medicines from the hospital.*

*(Focus group discussion with community members from Magu)*

## **Acceptability and accessibility of the screening service**

### ***Service providers***

Service providers appreciated the self-screening service, recognizing its utility for the community. The service providers reported that in general people do not visit hospitals for routine blood pressure checks because of the long waiting times, the lack of testing machines, and the high cost at hospitals. They also felt that many people had a low perception of personal risk for hypertension as there were few specific symptoms for the condition. The service providers believed that these factors delayed the diagnosis and treatment of hypertension. The service providers believed that providing a self-screening service in private drug shops would encourage more people to test for hypertension.

*It is a good service because many people do not want to go to the hospital, they feel happy to have their blood pressure taken here because the service is quick..*

*(In-depth interview, service provider from Nyamagana)*

*...most people do not know that they have hypertension because they don't know where they can have their blood pressure tested; here at the hospital we don't have a special service for blood pressure.*

*(In-depth interview, service provider from Magu)*

Service providers from the private drug shops admitted that, prior to the project, they had clients with symptoms of hypertension but who could not test as no local screening service was available. Service providers believed that the self-screening service would attract clients who would otherwise refrain from seeking medical advice for minor symptoms at hospitals.

*Many people were coming complaining of headaches, but we could not test them because we didn't have testing machines.*

*(In-depth interview, service provider from Nyamagana)*

*From my experience most people who are hypertensive stay with the symptoms for very long; some people say when they feel dizzy they take glucose or water not knowing that it might be hypertension.*

*(In-depth interview, service provider from Magu)*

### ***Service users and community members***

Service users and community members were happy about the self-screening service and requested a continuation. Community members thought that providing extra services at private drug shops is more convenient to the population.

*It is a good service because without this service we would not have been tested for blood pressure and we would not have been aware whether the problem is with our blood pressure or not.*

*(In-depth interview, service user from Magu)*

*I am very grateful for this service ... this service should continue because some people fear to go to the hospital for testing because they will be charged a lot of money.*

*(In-depth interview, service user from Nyamagana)*

### **Motivations for self-screening**

Service users varied in their motivations for self-screening. Some reportedly had no symptoms but decided to test to be sure of their health condition and because the blood pressure self-screening service was free and accessible. Some users who attended the drug shops complaining of headaches and palpitations tested after encouragement from the providers. One of the service users with a persistent headache who had visited the drug shop for pain killers recalled the events that led her to test:

*I went to the drug shop and told the pharmacist to give me pain killers because I had headache. I was so sick, she told me to sit on the chair and rest for awhile ... when I tested it was two hundred and six over one hundred fifteen.*

*(In-depth interview, service user from Nyamagana)*

### **Motivations and barriers to attending referral services**

The feasibility pilot found that very few (18/85) people newly discovered with high blood pressure attended the referral service within two weeks of the screening, as advised (Michael et al., 2016). In this study we sought to explore the factors that either facilitated or inhibited the referral process.

#### *Successful referrals (motivations)*

Those who attended the hospital after being referred were motivated by their expectation of a “special service provider” waiting for them at the hospital, believing that this would reduce waiting times and improve service provision.

*I went to the hospital and when I reached I just showed them the paper from the pharmacy and I was given the service straight away.*

*(In-depth interview, service user from Nyamagana)*

*...when I reached to the hospital I found a nurse whom I was directed from the pharmacy...I did not use a lot of time... paid five thousand (\$2.50) for my file.*

*(In-depth interview, service user from Nyamagana)*

Some of the service providers in the private drug shops told service users that they would get expedited treatment at the referral service.

*I tell them you will not line up, there will be a nurse waiting for you. Two people husband and wife whom I referred did not take long, they came back and said thank you, we got a good service.*

*(In-depth interview, service provider from Magu)*

Others who successfully attended the referral reported that they were motivated by concerns about their health and their desire to get treatment.

*I went because I don't want to live with hypertension because I always hear hypertension can make you die. I decided to go because I wanted to get treatment.*

*(In-depth interview, service user from Nyamagana)*

#### *Unsuccessful referrals (barriers)*

Participants reported facing barriers on multiple levels: individual, facility or systems level, and also as a result of the study set-up.

At the individual level, some service users with unsuccessful referrals did not see their condition to be severe. Some participants stated that they were not ready to start hypertension medication, feeling that they could control their blood pressure without modern medicine. Others questioned the efficacy of modern medication given their belief that hypertension was caused by their worries or stress. This conversation with one service user illustrated how disease perceptions influence treatment-seeking behavior:

*Service user: I will make a decision later but not now.*

*Interviewer: But why not now, what are you waiting for?*

*Service user: For now even if I get treatment my condition will not improve.*

*Interviewer: Why?*

*Service user: I am thinking a lot, I still have a lot of thoughts (stress).*

*(In-depth interview, service user from Magu)*

Others had a feeling that the high blood pressure they were experiencing was just temporary and would cease without any intervention:

*You know blood pressure can either go down or become high depending on how you are thinking [...] but later it may reduce if things go on well.*

*(In-depth interview, service user from Magu)*

Facility-level problems also acted as barriers to seeking referral services. In most government facilities, patients are required to pay a consultation fee. This, coupled with long waiting times and drug stock-outs, acted as facility/systems level barriers, preventing timely treatment and further encouraging patients to seek traditional medicines.

*One day I went there, they told me to buy a book, after that they told me to be in a queue and pay five thousand for the service. I did not have time to do all that process, I decided to go away.*

*(In-depth interview, service user from Nyamagana)*

Service providers confirmed that these were barriers, noting that long queues, lack of medicines and high treatment costs at the hospital discouraged patients from attending government hospitals.

Finally, the set-up of the study apparently confused some patients who incorrectly believed that because they received a free screening service as part of the pilot intervention, the same would be true at the hospital or that they would be served by a special provider at the referral site. After reaching the hospital, they soon found out this was not the case, and this prevented some from completing their referral.

*When I went, I found the doctor and he asked me, do you have the costs for those tests [.....] I was very annoyed and I told him I have come to check my health why are you telling me about the costs, for that reason, I changed my mind and decided to go away.*

*(In-depth interview, service user from Magu)*

## **Discussion**

Service providers from referral hospitals and attendants from private drug shops were knowledgeable of hypertension, in terms of the burden of disease, causes, symptoms and treatment. In light of this they recognized the need for increased identification and control. They found the provision of self-screening services in private drug shops as an acceptable mechanism which could help to increase case detection. Similarly, community members and service users also appeared aware of hypertension and were able to recall many symptoms. However, not all symptoms were deemed serious warranting immediate treatment. Stress was reported as the main cause of hypertension, and there was a common belief that modern medication would not be able to relieve hypertension. The study shed light on different barriers at the individual, facility and intervention level that prevented self-screening service users identified as having a raised blood pressure from attending follow-up care at health facilities. Furthermore, some community members reported a mistrust in modern medicine to treat hypertension.



Placing self-screening blood pressure services in private drug shops helped to overcome some structural and social barriers that generally prevented people from attending the higher-level health services for the purpose of testing their blood pressure, such as distance to facility, cost of screening, and long wait times (Dalal et al., 2011; M. J. Dewhurst & Walker, 2016; Kayima, Wanyenze, Katamba, Leontsini, & Nuwaha, 2013). Drug shop attendants were willing and able to offer blood pressure self-testing in their private drug shops; however the intervention study protocol was not always followed. Service providers at the private drug shops did not always provide adequate explanation of the referral procedure with some users who required follow-up, who incorrectly expected “special services” at the referral sites. Further intervention development and more detailed training on study protocols would be required to test the effectiveness of self-screening as a mechanism to increase attendance at the referral facilities. Should such an intervention be scaled up, quality control procedures would need to be put in place to ensure that private drug shop attendants do not diagnose hypertension nor prescribe medication.

A previous population-based study in Dar es Salaam, Tanzania reported that the uptake of health care services after screening results indicative of hypertension is low, with only 34% attending services within two weeks of diagnosis (Bovet et al., 2008). The findings from the pilot intervention study also concurred, with only 21% of participants attending the referral service after self-screening indicated high blood pressure (Michael et al., 2016). Our study findings shed light as to why uptake of hypertension treatment services at tertiary health facilities remains low. At the individual level many community members did not see hypertension as a serious condition needing immediate medical attention, with many preferring to use traditional medicines and home remedies. Community education initiatives are needed to raise awareness of symptoms and causes of hypertension and to increase the value placed on bio-medical treatment. System-level barriers (inadequate supply/availability of medication at health facilities and long waiting times) also need to be addressed in order to promote faith in the health facilities.

Our study had limitations inherent to qualitative studies, such as the potential for social desirability bias in respondents’ accounts (for example reporting favorably on the intervention to please the study team).

However, the lead investigator who conducted interviews and focus group discussions had extensive training and was separate from those researchers who implemented the pilot intervention study. Secondly this study had a small sample size and so may not be representative of all service providers and users. The pilot study, in which this qualitative study was embedded, was also small and involved only those seeking healthcare at private drug shops and two potential referral facilities. A larger study at the community level would be required to further explore barriers to attend services and to better explore the reticence of those with high blood pressure from attending referral to care and treatment. However, the use of qualitative methods allowed us to explore service providers' and users' attitudes and experiences toward self-screening for hypertension in order to guide future research and interventions.

### **Conclusions**

Our qualitative findings suggest that placing a hypertension self-screening service in private drug shops in Tanzania is acceptable to service providers and users. This intervention shows potential to improve hypertension screening in communities (Michael et al., 2016). However self-screening alone cannot ensure those in need of treatment receive it. A broader structural intervention is required to remove the barriers preventing people from attending health services for treatment of hypertension.

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**Competing interests:** None declared.

**Authors' contributions:** DK and JR designed the study protocol, supervised all the data collection, conducted the analysis and wrote a first draft of this manuscript. DM and AJ helped develop the study tools. DK conducted the data collection, conducted data analysis and wrote the first draft of the manuscript. JT, HR and JR conceived the study, designed the study protocol, developed tools and supported the analysis; JT and HR made significant contributions to the manuscript and revised it for intellectual content. JR wrote the final version of the manuscript. All authors read and approved the final manuscript. JR and DK are the guarantors of the paper.

### **List of tables**

Table1: The study participants shown by sampling category.

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**Ethical approval:** The study was approved by the Lake Zone Institutional Review Board (LZIRB) of the National Institute for Medical Research (reference number MR/53/100/104).

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Table 1. Participants in a qualitative study of self-screening for hypertension in Mwanza region, Tanzania, by sampling category

	Total
<b>In-depth interviews with service providers</b>	<b>8</b>
<i>Pharmacies attendants</i>	2
<i>Accredited drug dispensing outlets attendants</i>	4
<i>Nurses at the referral health facilities</i>	2
<b>In-depth interviews with self-screening service users</b>	<b>14</b>
<i>...with normal blood pressure</i>	6
<i>...with high blood pressure who attended referral</i>	6
<i>...with high blood pressure who did not attend referral</i>	2
<b>Focus group discussion with community members</b>	<b>24</b>