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Health behaviours and beliefs among Malawian adults taking antihypertensive medication and antiretroviral therapy: A qualitative study

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Abstract

In order to understand HIV-positive Malawian adults' experiences with hypertension management, we conducted qualitative interviews with 30 hypertensive adults who were also taking antiretroviral therapy. These interviews regarding hypertension management behaviours and beliefs were audio-recorded, transcribed, translated into English, and coded in Atlas.ti. Despite acknowledging the dangers of hypertension and the benefits of medication, many respondents missed their antihypertensive medication. Primary reasons included feeling healthy, health workers' advice to stop taking medicine when blood pressure normalized, side effects, and using herbs or non-prescription medicines to manage hypertension. Women highlighted difficulties with dietary modifications, and changes in their social relationships. Both men and women spoke about hypertension-related challenges with employment and household economics. These results suggest numerous challenges among adults managing hypertension and HIV in Malawi, and frequent suboptimal adherence to medication. We identified new key themes – the quality of adherence counselling for antihypertensive medication, the effects of hypertension on financial stability, and the role of social relationships in self-care – and encourage further investigation into these topics in low-income, high-burden countries.

Keywords

Hypertension; self-care; adherence; Malawi; HIV

Introduction

Low- and middle-income countries bear the majority of non-communicable disease burden (World Health Organization, 2013). Hypertension is a leading non-communicable disease

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Conflict of interest

The authors declare that they have no conflict of interest.

risk factor and is very prevalent worldwide (Benziger, Roth, & Moran, 2016; Bosu, Reilly, Aheto, & Zucchelli, 2019). A meta-analysis of studies from sub-Saharan Africa estimated that 26% of 40-year-olds, 35% of 50-year-olds, and 44% of 60-year-olds are hypertensive (Ataklte et al., 2015); and similar rates have been found in more recent data from the region including Malawi (Kavishe et al., 2015; Rücker et al., 2018).

Hypertension in sub-Saharan Africa, although prevalent, is largely undiagnosed and often uncontrolled even when treated (Ataklte et al., 2015; Kavishe et al., 2015). Successful hypertension management requires routine contact with a health system able to perform diagnosis and deliver treatment; but health systems in low- and middle-income countries are under-resourced and lack many of the inputs required to deliver non-communicable disease care (e.g., infrastructure, staffing, commodities, equipment) (Armstrong-Hough et al., 2018; Moucheraud, 2018; Pfaff, Scott, Hoffman, & Mwagomba, 2017). There is emerging evidence that adults living with HIV who are taking antiretroviral therapy (ART) have a possible ‘ART advantage,’ as regular engagement with health care for HIV treatment may also increase the likelihood that non-communicable disease comorbidities are diagnosed and managed (Manne-Goehler et al., 2017; Manne-Goehler et al., 2019). However, in the absence of fully integrated services, adults managing multiple chronic diseases – such as HIV and hypertension – may face access and adherence challenges that can ultimately affect their health outcomes (Hing et al., 2019; Knight, Schatz, & Mukumbang, 2018; Moucheraud et al., 2020).

For people prescribed antihypertensive medication, good self-care (adherence to medication, dietary improvements and lifestyle modifications such as increasing physical activity) is important for blood pressure control (Ho, Bryson, & Rumsfeld, 2009) and improved health outcomes (Pallangyo et al., 2020). But we understand very little about self-care for non-communicable diseases in low- and middle-income countries (World Health Organization, 2010). The existing literature from lower-resource settings has identified a number of potentially influential determinants of antihypertensive medication adherence, including: lack of knowledge about the conditions and effective management (Bowry, Shrank, Lee, Stedman, & Choudhry, 2011; Khatib et al., 2014; Rampamba, Meyer, Helberg, & Godman, 2017), forgetfulness (Khatib et al., 2014; Kim, Ndege, Jackson, Clauw, & Ellingrod, 2019), lack of social support (Bowry et al., 2011; Naanyu et al., 2016), stress and anxiety (Khatib et al., 2014; I. A. Kretchy, F. T. Owusu-Daaku, & S. A. Danquah, 2014b), difficulties with dietary changes, particularly due to social and cultural constraints, (Khatib et al., 2014; Rampamba et al., 2017), feeling healthy (or improved) (Bowry et al., 2011; Khatib et al., 2014), medication side effects (Bowry et al., 2011; Kim et al., 2019; Rampamba et al., 2017), the cost of medication and other financial constraints (Bowry et al., 2011; Kim et al., 2019; Naanyu et al., 2016), use of alternative medicines and remedies (Bowry et al., 2011; I. A. Kretchy, F. Owusu-Daaku, & S. Danquah, 2014a; Odusola et al., 2014), and access to care (distance, hours of service availability, wait times, medication availability/stockouts) (Naanyu et al., 2016; Odusola et al., 2014). Very little work has investigated factors affecting self-care practices, despite some evidence that healthy lifestyle behaviours may be more challenging to adopt than good medication adherence practices (Odusola et al., 2014); and the existing literature on medication adherence has focused primarily on identifying overarching themes rather than subgroup differences. Additionally, due to the possible ‘ART

advantage,' it is important to understand the potentially unique experiences of adults living with both HIV and hypertension.

We conducted qualitative research through semi-structured interviews with HIV-positive Malawian adults taking antihypertensive medications and ART. The goal was to understand experiences of living with hypertension -- including health behaviours and beliefs about hypertension management (both medication adherence and other self-care activities) -- and how these differ by respondent characteristics, primarily age, sex and marital status.

Methods

Study setting, sites and participants

Malawi is a country in South-eastern Africa, with a total population of approximately 18 million people (World Bank, 2017b). It is classified as a low-income country (World Bank, 2017a), with an estimated annual per-capita gross domestic product of approximately US\$ 300 (World Bank, 2017b). Approximately 30% of Malawian adults are estimated to be hypertensive, and most of these cases are undiagnosed and unmanaged (Ministry of Health Malawi & World Health Organization, 2010; Msyamboza et al., 2011). The Malawian essential health package includes hypertension care, to be provided for free at public sector health centers (primary) and district hospitals (secondary) (Government of the Republic of Malawi, 2017). The Malawi clinical guidelines specify levels of hypertension (mild: 140-159 mm Hg systolic, 90-99 mm Hg diastolic; moderate: 160-179 mm Hg systolic, 100-109 mm Hg diastolic; severe: >180 mm Hg systolic, >110 mm Hg diastolic), and stepped antihypertensive medication treatment (first line: hydrochlorothiazide, second line: add amlodipine, third line: add enalapril, fourth line: add atenolol) (Ministry of Health, 2015). It is estimated that approximately 9.5% of Malawian adults are living with HIV, and that 79% of these adults are receiving ART (UNAIDS, 2020). All adults with HIV are screened for hypertension upon initiation of ART, and are recommended to be rescreened annually thereafter (Ministry of Health and Population, 2018). However, few facilities in Malawi provide integrated HIV-hypertension care, so those needing hypertension management are typically referred to a separate clinic or facility.

This study was conducted at three secondary-level hospitals in central Malawi. At the time of this study, all offered hypertension management through the outpatient department (i.e., non-integrated with HIV services). Respondents were recruited from the ART program at participating sites in order to identify respondents taking both ART and antihypertensive medication(s). All respondents were adults (≥ 18 years old), HIV-positive, on ART, self-reported as diagnosed with hypertension, and had been prescribed antihypertensive medication(s) for at least 6 months. The HIV- and hypertension-related eligibility criteria were first ascertained by self-report, and then confirmed through clinical record review. The sample size was determined ex ante, and the study aimed to enroll 10 respondents per site (equally split between men and women); it was anticipated this was a sufficient number of interviewees to reach saturation on main themes.

Data collection

Clients presenting at the ART clinic for care were recruited using convenience sampling (sequentially recruited down the queue), based on eligibility criteria stated above. Following screening for eligibility, they were informed about the study and given an opportunity to ask questions. After providing written informed consent, interviews were conducted by highly experienced Malawian qualitative researchers (one MPH-level researcher [author KP] and two diploma-level research assistants, all with training and experience conducting qualitative research). Interviews and interviewees were gender-matched. All interviews were audio recorded with permission of the respondent. The interview guide was informed by the Behavioral Model of Health Services Use (Andersen & Newman, 2005) and included questions about accessing care for HIV and hypertension; here, we use data from a subset of questions about behaviours and beliefs related to hypertension management and medication adherence. To assess medication adherence, respondents were asked how many doses of antihypertensive medication they had missed during the prior week, and how many doses of ART they had missed during the prior month. On average, the interviews lasted 29 minutes (range 18-38 minutes).

Data analysis

The audio recordings were transcribed, translated to English, and imported to Atlas.ti version 8 software for coding and analysis. Two of the authors (CM and KP) each read a set of transcripts and generated a list of suggested codes (including emerging themes, i.e. not strictly restricted to constructs from the Behavioral Model of Health Services Use), and these were used to develop a draft codebook through consensus, which was then tested on a subset of transcripts and refined accordingly. This codebook was used to code all transcripts by the same two co-authors, and emergent codes were added as needed. After identifying main themes, we explored thematic variation by respondent characteristics: sex, age, duration on hypertension treatment, and marital status.

Ethical review

This study was reviewed and approved by the University of Malawi College of Medicine Research Ethics Committee and the Institutional Review Board at the University of California Los Angeles.

Results

We present general information about the study sample (demographics, self-reported adherence to medications) followed by findings organized by key themes related to beliefs and behaviors. Beliefs include: awareness of hypertension, attitudes toward the benefits of treatment, and opinions about the importance of medication adherence. Themes about behaviours include: social support for adherence, reasons for skipping or stopping medication, experience with medication side effects, use of complementary treatments, accommodating dietary changes, making changes to social relationships, and experiences with altered employment due to hypertension.

Study sample

30 adults were interviewed for the study. Most participants were female (n=21, 70%); although the study aimed for a gender-balanced sample, there were challenges in identifying eligible male respondents since approximately two-thirds of all individuals on ART in Malawi are women (Jahn et al., 2016). The median age of the full sample was 58 years, and the male respondents were slightly older than the women (Table 1). Men in this study also reported taking antihypertensive medications for a longer period of time (median 8 years, versus median 4 years for women). The median duration on ART for participants was 8 years. All men, versus only one-third of women, were married; almost half of women were widowed and 4 women were divorced.

Some respondents (n=9) said that they never miss their antihypertensive medication. This was much more commonly reported among men (almost half) than women (less than one-quarter). Three respondents (all women) said that they rarely miss or miss less than once per week on average, and 8 respondents (7 women and 1 man) said that they miss between 1-3 doses per week. One-third of respondents said that they miss frequently or have gaps in their medication coverage. People who said they never miss pills had been taking antihypertensive medication for 5 years (median) versus 8 years (median) for those who reported missing regularly or gaps in pill-taking (data not shown). Reported adherence to ART was much higher: nearly all respondents (n=25) said they never missed a dose of ART, three people said they missed one or less pill per month, one person said they miss almost never, and one person said they missed 4 pills last month.

High awareness of hypertension and benefits of treatment

There was high awareness about the dangers of hypertension: many respondents mentioned that hypertension can suddenly cause death or serious disability. This was reported among people with both good and poor adherence to antihypertensive medication.

You can be attacked anytime and anywhere. (male, 43y, 4 years on antihypertensive medication, never misses)

Because if you have a stroke, those around you will be affected. It is a burden.
(female, 55y, 11 years on antihypertensive medication, misses 1 dose per week)

Many respondents discussed how significant symptoms, or even a major health event, caused them to begin antihypertensive treatment. (It was common for respondents to refer to hypertension as 'BP,' or 'blood pressure.')

Among respondents who discussed the circumstances of their hypertension diagnosis (n=17), nearly all (n=14) were due to an acute event or symptoms of elevated blood pressure, while only 3 were diagnosed routinely with blood pressure screening during HIV care.

I saw total darkness all at once, I was not able to see. An ambulance took me to the hospital. After I woke up, I realized one eye was out and my mouth was crooked, I could not sit up or walk. They told me that I had a stroke caused by BP. (male, 43y, 4 years on antihypertensive medication, never misses)

I was at the farm, I just fell and had a stroke. This made me start treatment for BP.
(female, 70y, 4 years on antihypertensive medication, misses 1 dose per week)

Several respondents spoke about knowing someone, often a family member, who had hypertension and had died.

My mother died of BP, so yes BP is very dangerous. She just collapsed and was pronounced dead within an hour. I am scared of BP. (female, 55y, 11 years on antihypertensive medication, misses 1 dose per week)

It was common for respondents to say that the best way to avoid such major consequences was to follow doctors' recommendations and to have good adherence. This was mentioned primarily among people with good adherence.

BP is dangerous because if people have not gone to the hospital, they may suffer a stroke or lose the use of some limbs or even die. Sometimes we hear of people just dying without getting sick. (male, 58y, 13 years on antihypertensive medication, never misses)

If I stop my BP can get worse and I could lose my life, because BP is very dangerous. So, I try to take them every day no matter what, because they told me to take them every day. (female, 63y, 20 years on antihypertensive medication, misses <1 dose per week)

A few respondents – all women – mentioned low community awareness about the dangers of hypertension, as well as rumours and hearsay about hypertension management.

There is need for people to be educated about BP. I have met people who were having symptoms, and I have guided them to come to the hospital and get their blood pressure checked. (female, 48y, 6 years on antihypertensive medication, misses 1 dose per week)

Some churches tell their members to stop taking medication, and that they have been prayed for and healed. (female, 67y, 2 years on antihypertensive medication, never misses)

Social support helps with adherence to medication

Some respondents spoke of family support when obtaining medication refills as important for adherence. This was mentioned by both males and females, and more commonly among those who have been taking antihypertensive medication for a longer period of time.

My wife reminds me to take the drugs. (male, 64y, 12 years on antihypertensive medication, misses 1 dose per week)

There isn't much of a problem [with refills] because we send a child to town... to buy the drugs for me from the pharmacy. (female, 62y, 14 years on antihypertensive medication, never misses)

Acceptability of skipping or stopping medication if feeling healthy

Some respondents, particularly men, reported that they would stop taking their antihypertensive medications once they felt better. They said that, if one is not experiencing the signs and symptoms of hypertension, they can stop taking medication until the symptoms

return. Most people who said this had been taking antihypertensive medication for less than 5 years.

At first, I used to take them every day... Then I saw that I was not having problems with my BP as before, so I stopped. Then I got measured and saw that it had spiked a bit so I started taking them again. (male, 62y, 4 years on antihypertensive medication, misses 1 dose per week)

There was a time when I stopped taking them, when my BP was low. I have a gadget which shows me the level of my BP so I regularly monitor. These days I notice that it is fluctuating so I am constantly on drugs... (male, 63y, 8 years on antihypertensive medication, misses 1 dose per week)

Four respondents (three men and one woman) said they had been advised by a health worker that they could stop or pause their antihypertensive medications when their blood pressure was improved.

After they tested [my blood pressure], they told me I am alright and that I need to stop taking the medication. (female, 52y, 1 year on antihypertensive medication, misses 1 dose per week)

[The doctor] said my condition is stable and I should stop taking the drugs... They will let me know if they see that I need to get back on the drugs, if my BP is high... I do not stop taking the medication for good, but they need to observe me. I am now nearing a year since I stopped taking the medication and my BP level is the same as it was when I was taking the medication. (male, 43y, 4 years on antihypertensive medication, never misses)

Relatively infrequent reports of side effects or adverse events as a barrier to adherence

Three respondents (all women) reported side effects of treatment, namely weight loss (perceived as being caused both by the underlying hypertension and the recommended dietary changes) and dizziness. Two men mentioned severe medication complications, including sexual dysfunction and diabetes. Those who discussed side effects included respondents who reported adhering to their medication as well as respondents who reporting missing doses.

The drugs I was taking made me feel dizzy, the heart rate speeds up or at times you just feel like sleeping. (female, 46y, 2 years on antihypertensive medication, never misses)

These medications have their side effects. Those who take propanol or HCTZ [hydrochlorothiazide] for a long time, more especially HCTZ, eventually develop diabetes... [HCTZ] activates diabetes inside the body of a person. (male, 62y, 4 years on antihypertensive medication, misses 1 dose per week)

Alternative and complementary medicines used to manage hypertension, particularly those with poor adherence

Several people spoke about using herbs to manage their hypertension. Examples included moringa, garlic, cinnamon, hibiscus, sweet potato leaves, lemongrass, ginger, and

mushrooms. Respondents who mentioned this said that they take these herbs alongside their antihypertensive medications – although use of additional herbs was primarily mentioned by people who reported missing at least 1 dose per week; and only two people said they did not think the herbs were effective.

I take the mushroom when I see that my heart rate is high. It is from South Africa and it helps with things like BP, ulcers, body pains. My child got it for me... It's what I have been using since 2011. You have to buy the mushroom, and it is a bit hard for me [to afford it] ... But when I don't have the mushroom, I know that I am putting my own life at risk. (female, 60y, 2 years on antihypertensive medication, misses 1 dose per week)

There was a time when [my blood pressure] was high, and I tried taking some herbs. But there was no change, and the doctors advised me against it and told me to stick to the medication. (male, 63y, 8 years on antihypertensive medication, misses 1 dose per week)

Dietary changes are important but can be challenging

Some respondents spoke about the recommended dietary changes to manage hypertension: avoiding certain foods (red meat, fatty foods, salty foods, and sugars) and eating more vegetables and fruits. Although most people mentioned this matter-of-factly, some found the changes challenging, especially people who had been taking antihypertensive medications for relatively short periods of time.

When there is food with little salt it is not tasty to you. But we are told that it is just good to avoid salt or eat little salt. But we know that the aim of salt makes the food tastier and add flavour. (male, 62y, 4 years on antihypertensive medication, misses 1 dose per week)

For some respondents, particularly widowed women, the recommended dietary changes were seen as restrictive and difficult to adhere to. Respondents said that healthy foods are difficult to find, afford, or prepare.

When there is no one around, I go to sleep without eating because there is no one to buy food for me. (female, 70y, 4 years on antihypertensive medication, misses 1 dose per week)

Two male respondents spoke about how they have made changes in their diet at the household level and feel as though this is difficult for others in the family who do not need to eat a restricted diet.

What has changed really its diet. My wife at home doesn't allow that they should have their own food and I should also eat mine, so we just eat what I eat and I feel like it's not fair to her. (male, 64y, 12 years on antihypertensive medication, misses 1 dose per week)

Reducing stress and stressful relationships is part of self-care for hypertension

Several respondents – all women – discussed how they have changed their social relationships due to hypertension, avoiding relationships and situations that cause stress.

This was primarily mentioned by those who have been taking antihypertensive medication for only 1-2 years.

Socially, well I should not think a lot, I should not be at a noisy place, when someone wants to tell me something they should not tell me in a loud frightening way. (female, 49y, 2 years on antihypertensive medication, misses 1 dose per week)

I live well and do not argue with others because when I argue with people it does me no good. (female, 65y, 6y on antihypertensive medication, misses 1 dose per week)

When someone doesn't speak nicely to you ... the hospital will tell you that you have [high] BP due to what people are saying. (female, 50y, 1y on antihypertensive medication, never misses)

Hypertension imposes employment changes and financial constraints

Some respondents discussed how hypertension hindered their income-generating activities due to symptoms, or as a result of the need to make lifestyle changes such as avoiding stress. Both women and men mentioned this as a major concern, as did people both who reported never missing doses of their medication, as well as those who reported regularly missing doses.

Because when the BP [blood pressure] is high you don't do any form of business that can get you money. I sell vegetables, but when my BP is high I can't do that. (female, 57y, 8 years on antihypertensive medication, misses 1 dose per week)

When you have hypertension, you are weak and get frequent headaches, and you are unable to work. (male, 62y, 4 years on antihypertensive medication, misses 1 dose per week)

Discussion

In this population of adults living with HIV who had a median of 5 years on antihypertensive medications and 8 years on ART, respondents faced numerous challenges with managing their hypertension. We found high stated awareness of hypertension and its severe consequences – although our results do indicate many misunderstandings about the symptoms of hypertension, side effects of medication, and whether treatment should produce relief of numerous signs and symptoms attributed to elevated blood pressure. Previous studies in both low-income (Bowry et al., 2011; Khatib et al., 2014) and high-income countries (Marshall, Wolfe, & McKeivitt, 2012) have also identified misconceptions about symptoms related to hypertension (headaches and dizziness). This suggests areas for future research on effective messaging and communication strategies to raise awareness about hypertension and its management.

The use of alternative/complementary medicines for hypertension, as found in this and other studies (Bowry et al., 2011; Kretchy et al., 2014a; Odusola et al., 2014), should also be studied further – particularly since this may be associated with antihypertensive medication

non-adherence, and may be more common among people who cannot afford medications and those who have experienced side effects (Kretchy et al., 2014a), both of which were commonly reported among our respondents and in the broader literature. These findings also suggest that care for adults with hypertension might be strengthened through counseling about use of complementary medicines.

Many of our respondents reported frequent missed doses of antihypertensive medication pills – and very rare missed doses of ART. Some individuals reported skipping antihypertensive medications when feeling healthy. Others reported that health workers told them they could stop or pause hypertension treatment once normotensive. This may be misunderstanding or misreporting by the patient, or may be evidence that providers do not have adequate training on the management of hypertension. Future studies should assess content of hypertension adherence counselling messages, either using direct observation, client exit interviews conducted immediately following the care interaction, or a ‘mystery client’ approach that uses standardized patients to observe and evaluate care quality. It is of particular interest that poor adherence was common in this study even among people who acknowledged that hypertension is dangerous and that medication is effective. Robust adherence counselling for ART was essential in the fight against HIV, and hypertension management would similarly benefit from patient-centered counselling that is evidence-based and employs effective communication strategies.

There were two crosscutting themes in the results that we feel are novel contributions to the literature. First, we identified a potentially important relationship between hypertension and household finances. Respondents spoke about weakness and difficulty working due to hypertension, which in turn caused financial strain. Many of these older adults, especially women, had no spouse or other income-earner in the household, and some of them reported having dependents. These household configurations may enhance financial burden on older adults. Hypertension’s implications for households’ financial stability should be considered as policies and programs address the rising burden of non-communicable diseases. The complex interplay between disease status, social factors and economic status – and how this may affect adherence and consequently outcomes such as blood pressure control – is worthy of further study; and clinical programs and providers should be cognizant of the interconnectedness of household economics and hypertension management.

Second, gender dynamics may affect hypertension management in this setting. The women who participated in this study were primarily widowed or divorced (whereas all the male respondents were currently married), and these women reported unique challenges with hypertension management, particularly self-care activities. We found that men appeared more accepting of dietary changes, perhaps because their wife cooks their food; while women (especially those without husbands) found the changes more difficult to accommodate. Women also said that hypertension has affected their social relationships (in order to reduce stress), while men did not discuss this. A study from Kenya found that women were more likely to cite financial constraints as affecting their antihypertensive medication adherence (Naanyu et al., 2016) -- but such gender differences, and particularly the importance of social structures for adopting lifestyle modifications, are not commonly explored in the literature. Other studies have highlighted the importance of social support

for adherence, challenges in dietary adjustments due to social constraints, and stress around needing to cook for yourself (versus the rest of the household) (Bowry et al., 2011; Khatib et al., 2014; Naanyu et al., 2016) – and we would encourage a gender lens in additional research on these topics. Additionally, programs and providers may wish to consider gender-sensitive messaging about lifestyle modifications for hypertension management.

Some limitations of this study should be noted. First, all respondents were also taking ART and were recruited at a health facility; this is a subpopulation experienced with daily pill-taking and highly engaged with the health system, so their adherence and self-care behaviours may not generalize to HIV-negative groups or HIV-positive individuals without experience taking ART. Second, our population was highly treatment-experienced, having been on antihypertensive medications for a median of 5 years and on ART for a median of 8 years. It is possible that those initiating hypertension treatment may have different experiences, particularly in the first one to two years on treatment; and further studies should stratify by duration on treatment to represent both early and later experiences with hypertension self-care. Additionally, different people initiate hypertension treatment for different reasons (sometimes subsequent to an emergency event, sometimes diagnosed during routine care). Circumstances of diagnosis, and whether medication is being used for primary or secondary prevention, may affect hypertension management attitudes and behaviors, and although we did not collect data on this, future studies may consider doing so. Third, there may have been social desirability bias particularly when answering questions about self-reported adherence, and about use of alternative/complementary medicines (since these interviews were conducted at a health facility). Fourth, our sampled population was not gender-balanced, and the relatively smaller number of men recruited for these interviews - who were all married unlike the women in this sample - may have limited our ability to identify themes across marital status. Lastly, the qualitative data available for this analysis did not support an exploration of connections between and across the themes identified here. For instance, we were unable to investigate whether dietary changes were a compensatory mechanism among people who had stopped taking their medication because they felt healthy; or whether people with greater social support also perceived more benefits to treatment. Research on this topic should strive to increase its complexity and robustness in order to identify areas amenable to intervention across the interplay of factors shaping behaviour and ultimately, affecting outcomes.

The burden of non-communicable diseases in low-income countries is growing. Although much of the literature on hypertension has focused on health systems and services, health beliefs and behaviours are also critical and may affect the entire continuum of hypertension management (Musicha et al., 2016). There is increasing evidence that simply offering non-communicable disease care does not necessarily result in improved health outcomes (Ameh et al., 2017; Heller et al., 2020; Mendis et al., 2010; Osetinsky et al., 2019; Patel et al., 2018). Our results underscore the importance of examining health behaviours and beliefs in the context of non-communicable disease self-care, and of exploring social factors (such as gender and marital status/household arrangement) that may shape these. Understanding behavioural mechanisms that contribute to poorly controlled blood pressure and developing interventions that can result in behaviour change will be essential for reducing global inequities associated with hypertension.

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Table 1:

Respondent characteristics, hypertension behaviors and beliefs in Malawi (2019)

| | Total (n=30) | Female (n=21) | Male (n=9) |
|---|-------------------------|--------------------------|-----------------------|
| Age (years), median (range) | 58 (35-70) | 56 (35-70) | 60 (43-64) |
| Marital status (n) | | | |
| Married | 16 | 7 | 9 |
| Divorced | 4 | 4 | 0 |
| Widowed | 10 | 10 | 0 |
| Time on ART (years), median (range) | 8 (1-15) | 8 (1-12) | 5 (2-15) |
| Time on antihypertensive medication (years), median (range) | 5 (0.5-20) | 4 (0.5-20) | 8 (3-13) |
| Adherence to antihypertensive medication (n) | | | |
| I never miss | 9 | 5 | 4 |
| I miss < 1 dose per week (or very rarely) | 3 | 3 | 0 |
| I miss 1-3 doses per week | 8 | 7 | 1 |
| I miss more than 3 doses per week | 10 | 6 | 4 |
| Adherence to ART (n) | | | |
| I never miss | 25 | 18 | 7 |
| I miss < 1 dose per week (or very rarely) | 2 | 2 | 0 |
| I miss 1-3 doses per week | 3 | 1 | 2 |
| I miss more than 3 doses per week | 0 | 0 | 0 |