

## METHODS

# Knowledge, attitude, and practices of high-blood-pressure patients attended at Mutare city clinics in Manicaland province in 2022–2023

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**Objective:** The low socioeconomic status of Mutare city patients, shortage of medical staff, and lack of supported hypertension programs expose clients to poor or lack of counseling services; hence, the present study aimed to investigate the knowledge, attitude, and practices among those hypertensive patients.

**Materials and methods:** A cross-sectional correlational investigation was conducted to find the amount of knowledge about hypertension on hypertensive clients and the association between hypertension knowledge and good blood pressure management. All the hypertensive patients who were diagnosed at least 2 months prior to the study were included. A sample of 88 participants was used for this study. Convenience quota sampling was used where every clinic out of the 8 clinics should have supplied 11 hypertensive clients. Data were collected using a structured interviewer administered questionnaire. Logistics regression analysis was done, and odds ratio was used to assess the relationship of variables. The statistical level of significance was set at  $P < 0.05$ .

**Discussion and results:** A total of 80% of the participants were concluded to have good hypertension knowledge. Those who had at least a discussion with a health worker were 9.31 ( $p$ -value 0.005) folds more prone to reflect good knowledge than patients who never had a discussion about hypertension. Those who were 50 years and above were less likely to possess good knowledge in comparison to clients below 50 years of age (odds ratio 0.21,  $P$ -value 0.049).

**Conclusion:** There is a wrong belief of hypertensive medication causing diabetes, being addictive and traditional, with herbal medicines being cure to hypertension, and those with well-controlled blood pressure were found to have poorer knowledge compared to those with poorly controlled blood pressures.

**Keywords:** uncontrolled hypertension, low socioeconomic status, Mutare

## 1. Introduction

Hypertension, one of the NCDs, when uncontrolled, can cause complications including renal disease, cerebrovascular accidents, ophthalmic complications, and heart failure. Risks that can be addressed include sedentary lifestyle, too much salt intake, uncontrolled weight, tobacco smoking, and alcohol. Globally, around 1.28 billion adults in age range of 30–79 years were diagnosed as hypertensive,

with a majority of them living in low- and middle-income countries [World Health Organization [WHO] (1)]. WHO reported that less than half of the hypertensive adult population were successfully diagnosed and treated across the globe. In a meta-analysis to evaluate the hypertension impact and the policy it may implicate in Zimbabwe, the global estimated prevalence of hypertension was 30% (2). There seems to be no previous study quantifying the prevalence of hypertension in Manicaland

and Mutare. The Ministry does not have a documented policy on management of hypertension patients. All these factors expose patients to rushed care and poor counseling or no counseling at all. Client hypertension knowledge is essential for proper management of the condition to reduce mortality and morbidity. The aim of this study is to determine the level of knowledge and misconceptions in hypertensive patients who visited Mutare City from September 2022 to February 2023 and the demographic factors that affect the level of hypertension knowledge. There is poor data collection when it comes to hypertension as there are no set targets, and also, there is no specific funding for non-communicable diseases or hypertension programs. Despite being a major contributor to morbidity and mortality, health care for hypertension is still lagging behind. The Zimbabwean Ministry of Health and Child Care has no documented policy or guidelines regarding hypertension management. This poses a great risk of poor management of hypertensive patients. Hypertension is the most common outpatient non-HIV chronic disease in the city of Mutare. In 2021, 7,489 patients were registered as hypertensive patients, which is more than twice all other non-HIV chronic diseases combined. This means hypertension is a priority condition.

## 2. Methodology

### 2.1. The research design

The present report was a cross-sectional correlational study that was conducted to evaluate the amount of knowledge about hypertension on hypertensive clients who attended Mutare city clinics and to find out if there is an association between hypertension knowledge and good blood pressure control in these clients. The research design was chosen for as it determines association between variables.

### 2.2. Study setting

This study was carried out in Mutare City Council clinics, Manicaland, Zimbabwe, about 260 km from the country capital, Harare. According to the Health Information Department, Mutare city, the city has an estimated 2,24,450 people in 2022. Mutare City has nine health institutions; one is currently being used as an isolation hospital for infectious diseases, while the rest are primary health facilities.

### 2.3. Study population

The study population includes all the diagnosed hypertensive patients with at least 2 months duration prior to the clinic

visit at Mutare city clinics for consultations, drug resupplies, or other health services.

### 2.4. Inclusion criteria

All hypertensive clients who were 18 years or above and visited.

Mutare city clinics for health services during the time of the study were included. Hypertensive clients in this study indicate all those who had antihypertensive medications prescribed for them by a health worker at least 2 months prior to the day of the interview.

### 2.5. Exclusion criteria

All hypertensive clients who were diagnosed less than 2 months prior were excluded. All women with pregnancy-induced hypertension were also excluded. Furthermore, any hypertensive patient who was unwilling to participate or incapacitated to give consent was categorized under the exclusion pool in this present report.

### 2.6. Sample size

The size of the sample was estimated using Dobson's formula as the proportion we want is a qualitative variable,  $S = Z^2 * (p) * (1-p)/c^2$ , where  $Z = 1.96$  (for 95% confidence level)  $p = 0.645$  and  $c =$  margin of error (10%), with a good hypertension knowledge rate of 0.645% in hypertension patients as seen in the study by Chimberengwa et al. (3), with  $1.96^2 * 0.644 * 0.355 / 0.1^2 = 88$  participants.

### 2.7. Sampling procedure

Convenience quota sampling was used in this study. Every clinic out of the 8 clinics should have supplied 11 hypertensive clients. The days to visit the clinics were chosen randomly during the period of September 2022 to February 2023. Repeated visits were done to get 11 participants from each clinic. Every hypertensive client who visited the clinic on the day of study and was willing to be enrolled into the study was enrolled.

### 2.8. Data collection instruments

The investigator used a structured interviewer questionnaire to compile information on demography, knowledge, awareness, treatment, and control of hypertension; furthermore, other relevant information was adopted and modified from a study by Chimberengwa et al. (3).

## 2.9. Study variables

The dependent variables are hypertension knowledge status and blood pressure control. These variables are measured by the score on knowledge questions and assessment of the last three blood pressure readings in the patient booklet. Independent variables were demographic characteristics of the hypertensive patients, duration of hypertension, and their source of information; they also included the age, education level, religion, and marital status of the health workers.

## 2.10. Data collection procedure

Data were collected from participants using their history to get necessary information. A written informed consent was obtained from every participant who volunteered to participate in the study. Following a written informed consent, participants were interviewed in a private and confidential space using an interviewer-administered structured questionnaire to collect quantitative data. The place of interview was at the clinic.

## 2.11. Data analysis and organization

In this analysis, Microsoft Excel and SPSS were used for capturing, cleaning, and tabulation of all the data collected using the questionnaires. The independent variables were the demographics of participants, duration of hypertension, and patient source of hypertension information. Dependent variables were measured by the score on knowledge questions, and at least two of the last three blood pressure readings in their booklet within the last 6 months are in the normal range according to WHO standards. Those who have less than two blood pressure readings within the last 6 months were classified as poorly controlled. The questionnaire contained 10 queries focusing on knowledge on hypertension. An additional scoring of 6 points and above by a respondent was set as good knowledge; however, if it was 5 points or below, it was categorized as poor knowledge. Frequencies and proportions were computed for respondents' demographic characteristics, lifestyle-associated determinants, and beliefs and knowledge on hypertension treatment and control. Logistics regression analysis was done, and odds ratio was used to assess the relationship of variables. The confidence interval was set to evaluate the statistical level of significance with  $P < 0.05$ . In order to analyze data, we have coded and scored, aggregated into points, and clustered on knowledge, perceptions, and blood pressure control. Microsoft Excel was used for analysis of quantitative data.

**TABLE 1** | Sociodemographic profile of the study population ( $N = 88$ ).

Characteristic	Variables	Frequency (%)
Gender	Female	61 (69.3)
	Male	27 (30.7)
Age intervals	30–50 years	54 (61.4)
	51–90 years	34 (38.6)
Marital status	Married	56 (63.6)
	Divorced	9 (10.2)
	Widowed	20 (22.7)
	Single	3 (3.4)
Religion	Apostolic	19 (21.6)
	Christianity	65 (73.8)
	Other	4 (4.5)
Level of education	Primary	28 (31.8)
	Secondary	31 (35.2)
	Tertiary	29 (32.9)
Job description	Skilled	26 (29.5)
	Unskilled	44 (50)
	Unemployed	18 (20)
Monthly income (US\$)	< 100	37 (42)
	100–300	24 (27.2)
	> 300	26 (29.5)
	Not declared	1 (1.1)
Category of hypertension	Mild (140–159/90–99 mm Hg)	25 (28.4)
	moderate (160–179/100–109 mm Hg)	31 (35.2)
	severe hypertension ( $\geq 180/\geq 110$ mm Hg)	32 (36.3)

## 2.12. Ethical considerations

The investigator obtained ethical approval from the Ethics Committee of Africa University (AUREC) approval letter: Aurec 243623. The permission to collect data was sought from the city health directorate. A written informed consent was obtained from all participants using the local language. All the participants were assured that they can withdraw from the process whenever they want with no consequences. The privacy as well as the confidentiality was observed during the investigation process.

## 3. Results

### 3.1. Sociodemographic profile of study participants

A total of 88 participants' hypertensive people participated in this study. In **Table 1**, the sociodemographic profiles of hypertensive clients who were recruited in this investigation were described, where around 61 (69.3%) are females and 27 (30.7%) are males, and in their

**TABLE 2** | Stratified prevalence of hypertension knowledge in hypertensive clients (*N* = 88).

Belief category	Yes	No	Frequency n% (Yes)
Had positive sentiments and belief in effectiveness of blood pressure pills to manage hypertension	61	27	69.3%
Had negative comments about hypertension tablets	30	58	34.1%
Belief in herbal/traditional remedies to manage hypertension	29	59	32.9%
Do believe in herbal/traditional medicines	28	60	31.8%
Have not used herbs before	31	57	35.2%
Could use traditional medicines to manage hypertension if offered	44	44	50%
<b>Source of knowledge on HBP</b>			
Local clinic nurse	78	10	88.6%
Village health worker	0	88	0%
Public hospital	0	88	0
Private doctor	3	85	3.4%
Others, e.g., Internet, pharmacist	7	81	7.9%
<b>Reasons why patients default HBP medication</b>			
Side effects of diabetes	31	57	35.2%
Financial constraints	21	67	23.8%
Denial	3	85	3.4%
Fear of death	9	79	10.2%
Because medication is life time	14	74	15.9%
They have found traditional substitution	6	82	6.8%
They are healed	3	85	3.4%
Lack of knowledge	4	84	4.5%
Religious reasons	2	86	2.2%
Advice from peers	6	82	6.8%
I don't know	15	73	17.0%
<b>Current control of blood pressure</b>			
Blood pressure tablets	75	13	85.2%
Traditional medicines, remedies/herbs	7	81	8.0%
Nothing	6	82	6.8%

majority, they are Christians 65 (73.8%). About 28 participants, which is 31%, attended the primary level or below (Table 2). The majority of the participants were married 56 (63%), and the next common marital status was being widowed 20 (22.7%). Eighteen (20%) of the participants were not employed, 26 (29.5%) are skillfully employed, and 44 (50%) are unskillfully employed. Thirty-seven (42%) of the participants earned less than \$100 per month, 24 (27.2%) participants earned above \$100 but less than \$300, and 26 (29.5%) of the participants earned more than \$30.

### 3.2. Prevalence of hypertension knowledge in hypertensive clients

Table 2 indicates that the majority of the participants believe in HT treatment and control. Around 69.3% had something positive about antihypertension treatment. The majority of these positive responses said the treatment works to lower blood pressure and is useful

and necessary. A total of 34.1% had something negative to say about antihypertension treatment. The responses included complaints about side effects, expenses, and difficulties to get the tablets and being dependent on the treatment for life. A total of 32.9% believed in herbs and traditional medicines. Our site of study nurses was the primary source of knowledge on hypertension, and it contributes to up to 88.6% to hypertensive clients, while other sources include private pharmacists and private doctors (7.9%). Various reasons why some people are antihypertensive by default were given, and we categorized them into 12 different reasons. The most common reason given (35.2%) as a cause of defaulting treatment was fear of 'side effects' of antihypertension. The side effects speculated mostly are diabetes and cancer. The second most common reason cited by respondents was financial constraints (23.8%). Other reasons given were fear of dying from the medications, the fact that treatment is lifetime, denial, finding of traditional treatment, lack of knowledge, fear of addiction, and religious reasons.

**TABLE 3** | Knowledge on selected questions on hypertension ( $N = 88$ ).

Knowledge variables	Number of participants who answered correctly (%)	Number of participants who answered incorrectly (%)
If you need more knowledge on high blood pressure, where would you go?	84 (95.5%)	4 (4.5%)
How do you define high blood pressure?	4 (4.5%)	84 (95.5%)
Any one cause of high blood pressure?	88 (100%)	0
Any symptom/s of elevated blood pressure you know?	88 (100%)	0
Can one have high blood pressure with no symptoms?	64 (72.7%)	24 (27.2%)
How will you continuously know your blood pressure is poorly/well controlled?	50 (56.8%)	38 (43.2%)
What can happen if high blood pressure remains untreated?	82 (93.2%)	6 (6.8%)
What are risk factors for getting hypertension?	60 (68.10%)	28 (31.8%)
Beside high blood pressure tablets, how else can you prevent/control hypertension?	43 (48.9%)	45 (51.1%)
What should one do when blood pressure is normal while taking antihypertensives	81 (92.0%)	7 (8.0%)

**TABLE 4** | Participants' knowledge on causes and complication of hypertension ( $N = 88$ ).

Variables	Knowledge	No	Yes	Frequency (n%)
Causes	Stress	8	80	80 (90.9%)
	Diet	85	3	3 (3.4%)
	Hereditary	81	7	7 (8.0%)
	Medical conditions	88	0	0%
	Age	88	0	0%
Complications	Death	43	45	45 (51.1%)
	Stroke	30	58	58 (65.9%)
	Collapsing	85	3	3 (3.4%)
	Heart disease	79	9	9 (10.2%)
	Kidney disease	88	0	0%

### 3.3. Prevalence of good versus bad knowledge on high blood pressure

A total of 66 cases (80%) of participants had good knowledge when assessed with the knowledge questions. All participants answered correctly the questions about symptoms of high blood pressure and the causes of hypertension. 80% of the participants cited stress as a possible cause of hypertension. There is no participant who gave medical conditions and aging as causes of high blood pressure. **Table 3** shows the proportions of participants who mentioned different causes of hypertension. 86 (97.7%) participants answered that they would visit a health worker if they need more knowledge about hypertension. The question that had the least number of participants 4 (4.5%) who answered correctly was the question about defining high blood pressure. The most common known complications of hypertension among participants were stroke and death (**Table 4**). Other complications that were mentioned were loss of eyesight, heart failure, and collapsing. Kidney disease was not mentioned by any participant. When asked about what causes hypertension, stress was the most popular response

given (90.9% of participants). No participant mentioned medical conditions and aging as causes of hypertension.

### 3.4. Hypertension control

The majority of the participants 61 (69.3%) had poorly controlled average blood pressures.

### 3.5. Regression analysis on factors influencing hypertension knowledge

**Table 5** indicates a logistic regression analysis of parameters influencing knowledge on hypertension. Information was recoded in a way that those having scored below 6 points out of 10 were categorized as having poor knowledge and those who have scored 6 and above out of 10 were classified having good knowledge. There was no statistically significant association of gender, education, religion, and duration of hypertension treatment with good hypertension knowledge. Those who are 51 years and above were significantly less likely to be knowledgeable compared to the 30–50 years age group, with an odds ratio of 0.21 (95% CI 0.04–0.99) and a  $p$ -value of 0.049. Those that had skilled employment were 12.5 times (95% CI; 1.34–115.79) more likely to have better knowledge than those who had no employment at all, and this was statistically significant with a  $p$ -value of 0.026. Although not statistically significant, those who had unskilled employment were 2.64 (95%CI; 0.74–9.41) more likely to have better knowledge. Those who had a previous discussion about hypertension with a health worker were 9.31 (95% CI; 1.94–44.66) times more likely to have good hypertension knowledge than those who had not discussed with a health worker at all. With regard to beliefs in herbal and traditional medicine use, those who said they will accept herbal medicines if offered were 66% [OR 0.34 (95% CI 0.10–1.18)] less likely to have good knowledge compared to those who did not believe in herbs. Those who were



**TABLE 5** | Regression analysis for sociodemographic factors (*N* = 88).

Factor	Hypertension knowledge		OR (95% CI)	P-value
	Good <i>n</i> = 74	Poor <i>n</i> = 14		
<b>Gender</b>				
Female	48	13	0.14/(0.02–1.15)	0.07
Male	26	1	ref	
<b>Age</b>				
30–50	33	2	ref	
51–90	41	12	0.21/(0.04–0.99)	0.049
<b>Religion</b>				
Apostolic	16	3	ref	
Christianity	55	10	1.03/(0.25–4.20)	0.97
<b>Level of education</b>				
Tertiary	27	2	4.5/(0.85–23.95)	0.08
Secondary	26	5	1.73/(0.48–6.26)	0.40
Primary	21	7	ref	
<b>Employment</b>				
None	12	6	ref	
Skilled	25	1	12.5/(1.34–115.79)	0.026
Unskilled	37	7	2.64/(0.74–9.41)	0.13

Ref, Reference against which other categories were measured against.

using hypertensive medicines had no statistically significant difference in knowledge status compared to those who were using traditional medicines to control hypertension. Those who had their hypertension controlled were significantly less likely to have good knowledge when compared to those with poorly controlled hypertension, with an odds ratio of 0.18 (95% CI 0.05–0.60) and a *p*-value of 0.005. Participants who had at least a discussion with a health worker were 9.31 times (95% CI 1.94–44.66, *P*-value 0.005) likely to have good knowledge compared to those who have not had a discussion with a health worker.

## 4. Discussion

The study participants were all above the age of 30, which tallies with what is already known that hypertension mostly comes when people are aging. A total of 69.3% of participants were female, which may reflect better health seeking behavior of women compared to men (Table 2). Similarly, Chimberengwa et al. (3) found more women (64.5%). About two-thirds (63.6%) of the participants were married, 22. Seventy-five were widowed, followed by 10.2% who were divorced. Only a minority 3.4% of the participants were never married. This investigation was carried out in a disadvantaged urban community setting in which formal education is scarce and about a third of the participants (31.8%) were not educated beyond primary school and only about a third reached

tertiary level education (Table 2). Educational attainment was not significantly associated with good knowledge on hypertension. In contrast, Chimberengwa et al. (3) found educational attainment directly proportional to knowledge on hypertension in a rural community. Although education background affects understanding and seeking health knowledge, other factors may be affecting the knowledge levels of hypertensive population. Half (50%) of the participants were unskilled workers, and 29.5% of the participants had skilled employment (Table 2). In our study, employment status was strongly associated with good hypertension knowledge. This may be due to better exposure to information when one is gainfully employed. Our study participants mainly belong to the poor socioeconomic group as the majority (69.2%) of the participants earned less than US\$ 300 per month income (Table 2).

The knowledge status of participants in this study was good as 74/88 of the cases (85%) were considered to have good knowledge (Table 6). Our findings can also be related to what was seen in Karachi, Pakistan; 94.6% of the participants had high knowledge, and only 5.4% had low knowledge (4). In contrast to our study, other studies have found poor hypertension knowledge in high-blood-pressure patients. Machaalani et al. (5) had only 25.15% of HTN patients with adequate knowledge. Almas et al. (6) concluded HPT knowledge generally low, and Saleem et al. (7) had only 0.8% with adequate general knowledge about hypertension.

When assessed on individual questions, most participants (95.5%) failed to give cut-off points for high blood pressure. This is similar to survey in Shanghai, China, where participants were not familiar with the diagnostic criteria for hypertension (8) and also findings by Bilal et al. (9). In contrast, the majority of primary care patients in Venezuela correctly identified blood pressure numbers that are considered as normal (86.17%) (10). Knowledge about levels of high blood pressure is necessary for good management of hypertension. The knowledge on HTN is essential for patients for them to assess themselves and their blood pressure evaluation at home and to align with their blood pressure therapy, and they can smoothly be aware of their general health status and take action accordingly (11). The other question that had poor performance was about lifestyle modifications. More than half (51.1%) of the participants in this study could not give any other way of assisting controlling high blood pressure besides the tablets. Gong et al. had similar results (8). Participants were not aware that cigarette smoking and physical activity at low level were associated with hypertension. However, a huge number of participants are aware that salt intake is a potential risk factor linked to hypertension (9), and in Khartoum report, study subjects were knowledgeable on the key value of decreasing salt intake in managing hypertension (93.8%); a high percentage of participants (71.4%) responded correctly that regular exercise can assist to decrease hypertension. When asked about the causes

**TABLE 6** | Regression analysis of various factors versus knowledge of hypertension ( $N = 88$ ).

Factor	Hypertension knowledge		OR (95% CI)	P-value
	Good $n = 74$ (85%)	Poor $n = 14$		
<b>Duration of hypertension diagnosis</b>				
< 1 year	14	2	ref	
$\geq 1$ year < 5 years	28	6	0.67/(0.12–3.74)	0.64
$\geq 5$ years	32	6	0.76/(0.14–4.25)	0.76
<b>Hypertension control</b>				
Poor	56	5	ref	
Good	18	9	0.18/(0.05–0.60)	0.005
<b>Perceptions</b>				
<b>Can use traditional medicines if offered</b>				
Yes	40	4	ref	
No	34	10	0.34/(0.10–1.18)	0.09
<b>Previous discussion about hypertension</b>				
Had no discussion with a health worker	29	12	ref	
Had a discussion with a health worker	45	2	9.31/(1.94–44.66)	0.005
<b>Current treatment in use for hypertension</b>				
Hypertension medications	64	12	1.07/(0.21–5.49)	0.94
Other traditional remedies or none	10	2	ref	

Ref, Reference against which other categories were measured against.

of hypertension and complications of uncontrolled high blood pressure, most patients knew only stress (90.9%) and stroke (65.9%) plus death (51.1%), respectively, (Table 4). No participant mentioned it being unknown, with medical conditions and aging as causes of hypertension or renal disease as a complication, and a very few participants talked about heart disease. A similar lack in some knowledge was reported by Sudharsanan et al. (12), where only less than half of hypertensive individuals in the study reported heart problems as a main consequence of uncontrolled hypertension. Unlike our study, Sudharsanan et al. (12) found less than one-third of the participants who linked hypertension to stroke. Although most participants scored on these questions, the lack in some knowledge is not desirable as participants cannot link the complications; they are not aware of poor hypertension control.

When it comes to beliefs and attitudes, only about two-thirds (69.3%) (Table 3) had positive sentiments and beliefs in effectiveness blood pressure pills to manage hypertension. Our study had a high level of incorrect beliefs and knowledge. About a third of the participants (34.1%) had negative comments about hypertension tablets; about a third (32.9%) believed herbal/traditional remedies can manage hypertension and the participants can use traditional medicines to control high blood pressure if offered (Table 3). Chimberengwa et al. (3) had only 8.8 and 3% of participants using traditional herbs and prayer as high blood pressure treatment.

In this study, participants gave reasons that are not necessarily true or good reasons why patients default HBP

medications. The most prominent incorrect information was side effects of diabetes (35.2%), fear of death (10.2%), medication being for lifetime (15.9%), finding traditional substitution (6.8%), being healed (3.4%), and religious reasons (2.2%).

The source of hypertension knowledge is important as it determines whether hypertensive patients will get correct information or not and also the quality of information that they will get. 88.6% of our participants get hypertension knowledge from local clinic nurses, and only 3.4% had their knowledge from a private doctor and no participant had received their knowledge from a village health worker (Table 3). This is different from what was found in Lupane, where most of their hypertension-educated subjects (78.4%) had received the education from medical doctors (13). This is likely because the study was done in the outpatient department of a district hospital. In Turkey study, the majority of the educated clients (78.4%) obtained this education from medical doctors, 4.3% of them from nurses, and the remaining 3.3% from both medical doctors and nurses [Kilic et al. (11)].

In this study, there were no statistically significant differences in the level of knowledge when different genders and religions were compared. Similarly, Melnikov et al. (14) found the same result, and no relationship was found between sex and level of hypertension knowledge employment status. In contrast to our study, Akoko et al. (15) found male sex positively affecting knowledge of hypertension significantly. We found older age to be associated with lower levels of knowledge significantly. Those

who are 50 years and above were less likely to have good knowledge when compared to those below 50 years of age (odds ratio 0.21, *P*-value 0.049) (Table 5). Akoko et al. (15) found similar results with an age less than 63 years associated with good knowledge. These results can be attributed to younger patients being able to understand health information better than older patients. From our findings, it is critical to pay more attention on elderly hypertensive patients so that they get a better understanding of the condition.

Although statistically insignificant, those with tertiary and secondary educational attainment were 4.5 and 1.73 more likely to have better hypertension knowledge, being directly proportional to knowledge. This tallies so well with what was seen in previous studies. In Gwanda, clients who attained tertiary as well as secondary education were more likely to present good knowledge when compared to those who had a lower education level. According to Akoko et al. (15), the level of knowledge was correlated significantly with educational status. The reasons behind higher education being associated with better knowledge may be a better understanding that comes with education and a better economic status that is associated with education, which brings better exposure to knowledge resources and other determinants of health.

Those who had at least a discussion with a health worker were 9.31 (*p*-value 0.005) times more likely to have better knowledge than those who never had a discussion about hypertension with a health worker (Table 6). This means dedication by health workers to give at least a counseling session will go a long way.

In this study, there was no statistical difference in the level of knowledge when participants with different durations of hypertension treatment were compared for less than 1 year compared to 1 year or more to 5 years and more than 5 years, respectively. This entails us that there are no changes in the amount of knowledge as Mutare city patients are having longer durations of treatment. Kilic et al. (11) had similar results where HT duration did not show any statistical correlation between scores of the HTN knowledge. The longer duration of treatment is supposed to be a plus factor where patients have received more sessions of counseling. This may suggest patients are just coming to collect medicines from health facilities with no health information given to them. It is interesting to note that in this study, the odds of those with well-controlled blood pressure to have good knowledge were less than those with poorly controlled blood pressures, with an odds ratio of 0.18 (*P*-value 0.005) (Table 6). Knowledge about hypertension and its control is expected to influence blood pressure control. This is opposite to Wang et al. (16) findings where patients' knowledge on hypertension control was significantly related to the rate on hypertension control.

## 5. Conclusion

The study revealed that hypertensive patients who attend Mutare city clinics have good general hypertension knowledge, but they lack some vital knowledge which is necessary for proper control of high blood pressure. Demographic and health system factors that affect significantly the amount of knowledge in hypertensive patients are previous discussion with health workers and an age below 50 years. There is belief in traditional and herbal medicines as cure to hypertension. A significant proportion of the hypertensive population believe that hypertensive medicines can cause serious side effects like addiction and death. Those with well-controlled blood pressure were found to have poorer knowledge compared to those with poorly controlled blood pressures.

## Data availability statement

All data will be made available upon reasonable request.

## Ethics statement

Informed consent was obtained from all the respondents participating in this study before the conduct of the study, and they were assured of the confidentiality of any information obtained from them. Participation was voluntary, and the right of individuals to refuse participation in the study was duly respected.

## Authors contribution

TM designed the work, collected and analyzed data, and wrote the draft of the manuscript. MS contributed in revising the manuscript in its contents and design and data analysis.

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## Conflict of interest

Both authors declare no conflict of interest in this study.

## References

1. World Health Organization [WHO]. (2021).



2. Mutowo M, Mangwiro J, Lorgelly P, Owen A, Renzaho A. Hypertension in Zimbabwe: a meta-analysis to quantify its burden and policy implications. *World J Metaanal.* (2015) 3:54–60.
3. Chimberengwa P, Naidoo M, Isangula K, cooperative inquiry group. Knowledge, attitudes and practices related to hypertension among residents of a disadvantaged rural community in southern Zimbabwe. *PLoS One.* (2019) 14:e0215500. doi: 10.1371/journal.pone.0215500
4. Nadeem M, Mari A, Iftikhar S, Khatri A, Sarwar T, Patel M. Hypertension-related knowledge and its relationship with blood pressure control in hypertensive patients visiting a semi-private tertiary-care charity hospital in Karachi, Pakistan. *Cureus.* (2019) 11:e5986. doi: 10.7759/cureus.5986
5. Machaalani M, Seifeddine H, Ali A, Bitar H, Briman O, Chahine M. Knowledge, attitude, and practice toward hypertension among hypertensive patients residing in Lebanon. *Vasc Health Risk Manag.* (2022) 18:541–53.
6. Almas A, Godil S, Lalani S, Samani Z, Khan A. Good knowledge about hypertension is linked to better control of hypertension; a multicentre cross sectional study in Karachi, Pakistan. *BMC Res Notes.* (2012) 5:579. doi: 10.1186/1756-0500-5-579
7. Saleem F, Hassali M, Shafie A, Awad A, Bashir S. Association between knowledge and drug adherence in patients with hypertension in Quetta, Pakistan. *Trop J Pharmaceut Res.* (2011) 10:125–32.
8. Gong D, Yuan H, Zhang Y, Li H, Zhang D, Liu X, et al. Hypertension-related knowledge, attitudes, and behaviors among community-dwellers at risk for high blood pressure in Shanghai, China. *Int J Environ Res Public Health.* (2020) 17:3683.
9. Bilal M, Haseeb A, Lashkerwala S, Zahid I, Siddiq K, Saad M, et al. Knowledge, awareness and self-care practices of hypertension among cardiac hypertensive patients. *Glob J Health Sci.* (2016) 8:9.
10. Lugo-Mata Á, Urich-Landeta A, Andrades-Pérez A, León-Dugarte M, Marcano-Acevedo L, Guillen M. Factors associated with the level of knowledge about hypertension in primary care patients. *Med Univ.* (2017) 19:184–8.
11. Kilic M, Uzunçakmak T, Ede H. The effect of knowledge about hypertension on the control of high blood pressure. *Int J Cardiovasc Acad.* (2016) 2:27–32.
12. Sudharsanan N, Ali M, McConnell M. Hypertension knowledge and treatment initiation, adherence, and discontinuation among adults in Chennai, India: a cross-sectional study. *BMJ Open.* (2021) 11:e040252.
13. Goverwa T, Masuka N, Tshimanga M, Gombe N, Takundwa L, Bangure D, et al. Uncontrolled hypertension among hypertensive patients on treatment in Lupane District, Zimbabwe, 2012. *BMC Res Notes.* (2014) 7:703. doi: 10.1186/1756-0500-7-703
14. Melnikov S, Itzhaki M, Koton S. Age-group and gender differences in stroke knowledge in an Israeli Jewish adult population. *J Cardiovasc Nurs.* (2018) 33:55–61.
15. Akoko B, Fon P, Ngu R, Ngu K. Knowledge of hypertension and compliance with therapy among hypertensive patients in the Bamenda Health District of Cameroon: a cross-sectional study. *Cardiol Ther.* (2017) 6:53–67.
16. Wang X, Bai H, Ma K, Li B, Qi J, Chen B, et al. Relationship between the patients' knowledge on hypertension prevention and control and the rate on blood pressure control. *Zhonghua Liu Xing Bing Xue Za Zhi.* (2003) 24:1082–5.