

DOI: <https://dx.doi.org/10.18203/2319-2003.ijbcp20212916>

Original Research Article

Effects of medication knowledge on medication adherence among hypertensive patients at Matero level one hospital, Lusaka city, Zambia: a cross sectional study

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Received: 01 June 2021

Revised: 05 July 2021

Accepted: 06 July 2021

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ABSTRACT

Background: Medication adherence is the mainstay to good treatment outcomes. Failure to adhere to medication in hypertensive patients may lead to considerable deterioration of the disease resulting in increased costs of healthcare and mortality. Knowledge about the name of the drug, indications and side effects may enhance medication adherence. Therefore, the aim of this study was to assess effects of medication knowledge on medication adherence among hypertensive patients.

Methods: This was a cross-sectional study that involved 120 hypertensive patients. A structured questionnaire was used to collect data on demographic characteristics. Adherence was assessed using the 8-item Morisky medication adherence scale while patient's medication knowledge was assessed using a 7-item scale. Multiple logistic regression was used to assess factors associated with medication adherence.

Results: The mean age of participants was 59 years (SD±14.9) and 10 (8.3%), 42 (35%) and 68 (56.7%) had adequate, average and poor medication knowledge respectively. The prevalence of adherence in this study was 37.5%. In multivariable logistic regression analysis, uncontrolled blood pressure (BP) (AOR: 0.38, CI: 0.16-0.90) was associated with lower likelihood of adhering to medication.

Conclusions: The adherence level to treatment was low and medication knowledge of hypertensive patients was generally poor. Uncontrolled BP was associated with non-adherence. Patients with uncontrolled hypertension should be given health education and counselling regarding their condition to improve medication adherence.

Keywords: Medication adherence, Knowledge, Medications, Hypertensive patients, Hypertension

INTRODUCTION

Medication adherence is the mainstay to good treatment outcome while poor adherence to medication has been established as a cornerstone contributor to morbidity and mortality in hypertensive patients.^{1,2} Medication adherence is defined as the degree to which the person's

behaviour matches with the agreed recommendations from a healthcare provider.³ Studies have shown that the prevalence of high blood pressure is on the rise especially in Sub-Saharan Africa despite the availability of various effective class of antihypertensive medications, uncontrolled BP has kept on surging worldwide.²

The proportion of adherence is usually high among patients with acute ailments compared to patients with chronic conditions.⁴ Hypertension (HTN) mostly turns out to be chronic in the majority and hence calls for a lengthy or lifetime period of treatment with maximum adherence.^{5,6} There are many factors which lead to poor patient adherence to their prescribed medications. One study reported that a significantly higher proportion of the group that was adherent named their drugs correctly and could also mention indication, dosage, timing and duration of its use.⁶ Furthermore, issues like not having somebody to help keep track of when to take medications, having the urge to take medication only when in discomfort and fear of side effects such as dizziness and headache have also been recorded as drivers to poor adherence to antihypertensive medications.⁷

Medication knowledge has also been found to be a determinant of medication adherence in hypertensive patients. The ability to remember the names of drugs, its timing, the correct dose and indications have been shown to be associated with non-adherence, also, some have reported that knowledge about HTN and its treatment influence adherence.^{6,8,9}

While the knowledge of hypertension as a condition and its effect on medication adherence has been well investigated, effects of the knowledge of antihypertensive medication on the adherence to medication have not been extensively studied. Therefore, this study aimed at assessing the effects of medication knowledge on the medication adherence among hypertensive patients at Matero level 1 hospital, Lusaka, Zambia.

METHODS

Study setting

This was a cross-sectional study carried out in Lusaka city at outpatients' department at Matero level 1 hospital in Lusaka Zambia. The study was conducted from February to March 2018. The hospital attends to an estimated 300 hypertensive patients per month and is a referral for patients from clinics and health centres in its vicinity.

Study population

The study included hypertensive patients of age 18 years and above receiving antihypertensive treatment for at least 6 months. We excluded patients that were mentally retarded and those who did not sign informed consent form.

Sample size

Using the single population proportion formula,

$$n = \frac{Z^2 P (1-P)}{d^2},$$

where,

n=sample size,

Z=1.96, factor from normal distribution,

P=prevalence is 0.094 (based on hypertension prevalence in a study done by (Doulougou et al 2014,

d=absolute sampling error.

The sample size was calculated to be 130.

Data collection

At the beginning of the study, the participants were informed about the objective of the study and that their participation was voluntary. Confidentiality was assured by using codes rather than names. Data collection about medication knowledge was done using a pretested self-administered questionnaire which was a standard questionnaire adopted from the previous study and modified to suit our setting.⁶

The questionnaire contained closed ended questions and was divided into three sections. Section A aimed at obtaining demographic information about the participants including age, sex, marital status, occupation, residence and education level. Section B focused on getting information on the hypertensive medication knowledge and a score of 1 was given for each correct answer and otherwise zero score was given. For the purpose of this study, medication knowledge consisted of seven specific items of information which included medication name, purpose, side effects, duration of therapy, goals of therapy, expiry date and dose. A score of 0-7 was used. A score of 0-3 was considered as poor knowledge, a score of 4-5 moderate knowledge and a high score of 6-7 adequate knowledge. In order to assess the association between knowledge and patients medication adherence, participants were clustered into those who had adequate knowledge and those who had poor knowledge.

Section C was designed to obtain information about the patients medication adherence. The Morisky medication adherence scale, an 8-score scale containing 8 questions was used to obtain this information. Each incorrect response was given a score of 1. A score of 0 meant that the patient was adherent and a score of 1-8 meant that the patient was non-adherent. Blood pressure control was classified based on eighth joint national committee (JNC 8).¹⁰ Systolic blood pressure of <140 and diastolic of <90 mmHg showed good blood pressure control in patients less than 60 years old while systolic blood pressure of ≥140 and diastolic of ≥90 mmHg showed poor blood pressure control in patients less than 60 years old. Systolic blood pressure of <150 and diastolic of <90 mmHg showed good blood pressure control in patients aged 60 years and above while systolic blood pressure of ≥150 and diastolic of ≥90

mmHg showed poor blood pressure control in patients aged 60 years and above.

Data analysis

Data was first cleaned up and checked for accuracy and consistency then entered and analysed using STATA version 13 (Stata Corp., College Station, Texas, USA). Frequencies, proportions and summary statistics were used to describe the study population in relation to relevant variables. Unadjusted regression was carried out to see the putative associations of each independent variable with the dependent variable. Independent variables with p value <0.2 in the unadjusted logistic regression were transferred into the adjusted logistic regression model and variables with p value <0.05 in the final model were regarded as associated factors of medication adherence. Odds ratio and 95% confidence interval were also used to identify the presence and strength of association.

RESULTS

Socio-demographic characteristics

In this study, a total of 130 questionnaires were circulated, of which 120 were filled resulting in a response rate of 92.3%. The mean age of the participants was 59 years (SD±14.9), with above half 62 (51.7%) being over 60 years old. Under three-quarters 86 (71.7%) of the participants were female and majority 66 (55%) of the participants were single. Most participants 75 (62.5%) were unemployed,

half were living in high density populated areas and 84 (70%) had uncontrolled high BP. The socio-demographic characteristics of the 110 participants in the study are presented in Table 1.

Patient's knowledge about their medications

In this study regarding the medication knowledge as shown in Table 2, most participants were aware about the purpose of medication 100 (83.3%), expiry date 105 (87.5%) and duration of treatment 73 (60.8%). Low medication knowledge awareness was observed regarding the name of medication 51 (42.5%) dose 15 (12.5%), goal of therapy 9 (6.7%) and side effects 8 (6.7%). Overall, the percentage of medication knowledge in this study was as poor, moderate and adequate were 68 (56.7%), 42 (35%) and 10 (8.3%) respectively.

Factors associated with medication adherence

Based on unadjusted analysis, uncontrolled high BP (COR: 0.44, CI: 0.20-0.98) and poor level of medication knowledge (COR: 0.23, CI: 0.06-0.93) were associated with lower likelihood of medication adherence while knowing the goal of therapy (COR: 6.72, CI: 1.33-33.9) showed higher likelihood of medication adherence (Table 3). After transferring the variables into the adjusted regression analysis, uncontrolled high BP (AOR: 0.38, CI: 0.16-0.90) was the only factor that significantly associated with lower likelihood of medication adherence as shown in Table 4.

Table 1: Baseline characteristics of hypertensive patients (N=120).

Variables	Frequency	Percentage
Age (in years)		
<60	58	48.3
≥60	62	51.7
Sex		
Male	34	28.3
Female	86	71.7
Education level		
Primary	72	60.0
Secondary	38	31.7
Tertiary	10	8.3
Marital status		
Single	66	55.0
Married	54	45.0
Employment status		
Employed	45	37.5
Unemployed	75	62.5
Residence		
Medium density	60	50
High density	60	50
Treatment outcome		
Controlled BP	36	30
Uncontrolled BP	84	70

Table 2: Patient's knowledge about their medications.

Knowledge item	Frequency	Percentage
Knows name of medication	51	42.5
Knows purpose of medication	100	83.3
Knows dose of medication	15	12.5
Knows duration of medication	73	60.8
Knows goals of therapy	9	6.7
Knows expiry date	105	87.5
Knows side effects	8	6.7
Total knowledge		
Poor	68	56.7
Moderate	42	35
Adequate	10	8.3

Table 3: Bivariate analysis of factors associated with medication adherence.

Variables	Category	COR	95% CI	P value
Age (in years)	<60	Ref		0.777
	≥60	0.89	0.43, 1.88	
Gender	Male	Ref		0.465
	Female	0.73	0.32, 1.69	
Marital status	Single			0.359
	Married		0.33, 1.48	
Education level	Primary	Ref		0.371
	Secondary	1.46	0.64, 3.35	
	Tertiary	1.01	0.26, 3.90	
Employment status	Employed	Ref		0.961
	Unemployed	1.01	0.48, 2.18	
Residence	Medium density	Ref		0.091
	High density	0.52	0.25, 1.10	
Treatment outcome	Controlled BP	Ref		0.045*
	Uncontrolled BP	0.44	0.20, 0.98	
Knows medication name	Yes	Ref		0.962
	No	0.98	0.46, 2.07	
Knows medication purpose	Yes	Ref		0.210
	No	0.54	0.20, 1.42	
Knows medication dose	Yes	Ref		0.182
	No	2.10	0.71, 6.25	
Knows medication duration	Yes	Ref		0.194
	No	0.61	0.29, 1.29	
Knows goal of therapy	No	Ref		0.021*
	Yes	6.72	1.33, 33.9	
Knows side effects	Yes	Ref		0.454
	No	1.73	0.41, 7.30	
Knows expiry date	Yes	Ref		0.435
	No	0.65	0.23, 1.93	
Medication knowledge	Good	Ref		0.039*
	Poor	0.23	0.06, 0.93	

COR: crude old ratio, CI: confidence interval, Ref: reference category, *p value <0.05.

Table 4: Multivariable logistic regression to determine factors associated with medication adherence.

Variables	Category	AOR	95% CI	P value
Residence	Medium density	Ref		0.177
	High density	0.53	0.21, 1.97	

Continued.

Variables	Category	AOR	95% CI	P value
Treatment outcome	Controlled BP	Ref	0.16, 0.90	0.029*
	Uncontrolled BP	0.38		
Knows medication purpose	Yes	Ref	0.21, 1.97	0.440
	No	0.64		
Knows medication dose	Yes	Ref	0.38, 7.47	0.499
	No	1.67		
Knows medication duration	Yes	Ref	0.29, 1.94	0.563
	No	0.76		
Knows goal of therapy	No	Ref	0.86, 29.3	0.073
	Yes	5.02		
Level of knowledge	Good	Ref	0.06, 2.47	0.317
	Poor	0.39		

AOR: adjusted old ratio, CI: confidence interval, Ref: reference category, *p value <0.05.

DISCUSSION

We assessed the effects of medication knowledge on medication adherence in hypertensive patients at Matero level 1 hospital, in Lusaka City Zambia. We found that hypertensive patients had low level of medication adherence and poor knowledge about antihypertensive drugs. Uncontrolled high BP was found to be significantly associated with adherence to medication.

The effectiveness to treatment is lowered due to non-adherence to medication and places a significant cost burden on healthcare systems.^{11,12} Therefore, non-adherence to medication is a problem in the management of patients with long-lasting diseases such hypertension requiring long-term treatments.^{13,14}

In this study, only 37.5% of patients adhered to their antihypertensive medications. The proportion of adherence to antihypertensive medications in this study was lower than those reported in Pakistan 62.5%, Ghana 41.4%, Egypt 73.2%, Ethiopia 67%, 65.1% China and England 79%.^{6,14-18} The lower level of adherence in our study could be probably attributed to low level of education and old age among the participants as more than half had only attained primary level and above 60 years. Some studies have reported that insufficient patient education influenced medication compliance especially in older patients.¹⁹ However, contrary to this study, other studies have reported much lower levels of adherence. For example, in France 33.6%, Ethiopia 31.4%, China 27.5% and Cameroon 32.3%.²⁰⁻²³ Although we cannot offer a plausible explanation for such a finding, it is surprising that France and China which are developed countries and expected to have more educated people had lower levels compared to this study.

This study reviewed that most of the participants had good medication knowledge about the purpose of medication but had poor medication knowledge regarding side effects. This was supported by three previous studies that were conducted in Denmark, USA and Jordan which also reported similar findings.^{24,26} Additionally, our study

observed that less than half (42.5%) of the participants correctly named their medication. This was conflicting to the finding of a previous study which reported more than half (69.5%) of respondent named their medications correctly.⁶ The difference in study findings regarding correctly naming the medication could be attributed to the age because the majority of the participants in our study were elderly patients who could easily forget the name of the medicines. Additionally, level of education could have contributed as the majority of participants in our study had attained only primary education.

Generally, our study found that only 8% of the participants had adequate medication knowledge. The medication knowledge score in this study was very poor when compared to medication knowledge reported in Jordan (62.3%) and Turkey (64.5%).^{26,27} The high medication knowledge levels observed in the previous two studies done in Jordan and Turkey could be ascribed to high literate levels of participants as most of them had attained high education as well as relatively young age. High literate levels as well as relatively young age have been reported in some studies to significantly predict the medication knowledge.²⁶⁻²⁸

Our study also assessed the independent variables associated with medication adherence. In the adjusted logistic regression analysis, individuals with uncontrolled high BP were significantly more likely to have lower medication adherence. This finding is in keeping with other studies.^{8,28} In this study, the age, education level and gender were not associated with medication adherence. This was in contrast with some studies which reported that individuals with younger age, high education level and male patients are more likely to adhere to medication.^{6,8,26,30,31} However, some studies have reported that advanced age and female patients are more likely to adhere to medication.^{13,28,32}

This study found no association between medication knowledge and medication adherence. In disagreement to this study, some studies have found increased medication knowledge to be associated with medication adherence.^{26,28}

Regarding the contents of medication knowledge, a study that was conducted in Turkey reported that patients who knew the names, the purpose and side effects of their medications were likely to adhere to treatment.²⁷ Also, Karaeren et al (2009) reported that knowing the duration and the purpose of medicine significantly increased the adherence rates while knowing the side effects of medicine reduced the adherence to medication.³³ The findings of the above studies regarding the contents of medication knowledge did not support the findings of the present study in which we found no association between contents of medication knowledge and medication adherence.

The nature of our study may have encountered several study limitations. The inherent nature of the cross-sectional studies are prone to social desirability bias.³⁴ However, we assured the participants that their responses were not going to be tied to them and the questionnaire was self-administered. The nature of our study may also be predisposed to recall bias and subsequently affect true adherent level.³⁵ Nevertheless, we adopted the widely accepted Morisky medication adherence scale of measuring adherence which contains carefully selected questions.

CONCLUSION

The adherence level to treatment was low and medication knowledge of hypertensive patients was generally very poor. In this study, uncontrolled BP was associated with non-adherence. Patients with uncontrolled hypertension should be given health education and counselling regarding their condition to improve medication adherence.

ACKNOWLEDGEMENTS

Our heartfelt gratitude goes to the university of Zambia, school of health sciences and pharmacy department for the support rendered during the research period. We would also like to thank members of staff at Matero level 1 hospital for their technical support during data collection.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Kampamba M, Abanur F, Hikaambo CN, Mudenda S, Saini K, Kaonga P. Effects of medication knowledge on medication adherence among hypertensive patients at Matero level one hospital, Lusaka city, Zambia: a cross sectional study. *Int J Basic Clin Pharmacol* 2021;10:893-9.