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Hypertensive medication adherence status and associated factors among patients attending a hypertensive clinic at Jakaya Kikwete Cardiac Institute, Dares Salaam

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Abstract

Background: Effective hypertension control depends on consistent adherence to antihypertensive medications. In Tanzania, little is known about the adherence status to antihypertensive medications and their associated factors. We determined adherence status and associated factors among adult patients attending a hypertensive clinic at a tertiary hospital in Dar es Salaam.

Methods: This was a cross-sectional study. Simple random sampling was used to recruit 379 hypertensive patients who were prescribed one or more regular antihypertensive medications for at least a month. A self-reporting questionnaire was used to measure medication adherence. Data were analyzed using SPSS computer software version 20. Descriptive statistics were used to summarize the data. The associations of variables with medication adherence were determined using the chi-square test and logistic regression.

Results: The proportion of antihypertensive medication adherence among the patients was 55.40%. Use of traditional medicine (AOR=0.08, 95% CI=0.04-0.18), believing that prayers can cure hypertension (AOR=0.15, 95% CI= 0.09-0.27), Having health insurance (AOR=2.97, 95%CI=1.07-8.30) and pharmacy service (AOR=0.57, 95%CI= 0.33-0.98) were significantly associated with adherence to antihypertensive medications.

Conclusion: The study showed that only 55.40% of patients had good adherence to antihypertensive medication, which was observed to be low. Factors such as the use of traditional medicine, believing that prayer can cure hypertension, unsatisfactory experience with pharmacy services, and having no health insurance were significantly associated with poor adherence to antihypertensive medications. To improve hypertension control among patients, healthcare providers and policymakers should address these factors by identifying and implementing workable strategies that are patient.

Keywords: Hypertension, adherence, medication, patients, Dar es Salaam

Background

According to the World Health Organization, hypertension is when blood vessels consistently raise pressure (WHO, 2003b). Hypertension is a leading cause of cardiovascular-related morbidity (Rachael, 2017). The global prevalence of hypertension is 31% among adults over 18 years (County,

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2019). It has a mortality rate of at least 7.5 million deaths per year globally (Rachael, 2017) and is considered a top three cause of morbidity and mortality worldwide (Abegaz et al., 2017).
Uncontrolled hypertension is a significant burden in many African countries; despite this fact, much of the focus and resources are directed towards infectious diseases (Bosu et al., 2019). The prevalence of hypertension is reported to be 10%-20% higher in Tanzania than in other nations in the Sub-Saharan region (Galson et al., 2017). This could be attributed to growing urbanization and changing living styles, especially in large cities like Dares Salaam. Lifestyle changes include consuming more processed diets, physical inactivity, increased alcohol consumption, and cigarette smoking (Joho, 2012), which are all the major modifiable determinants of hypertension (Munnangi & Boktor, 2019; Ng et al., 2020; Rachael, 2017). One study conducted in Dar-es-Salaam, Tanzania, showed that hypertension was 37% (Rachael, 2017).

Medical treatment is an essential strategy in controlling hypertension; this requires patients to adhere to medication regimens strictly. Medication adherence is “taking medication to the level as a health care provider has ordered it”. Patients using medication must comprehend that medications are critical in achieving targeted blood pressure (Tsadik et al., 2020; WHO, 2003a). Poor adherence to antihypertensive medications is the most significant barrier to achieving targeted blood pressure levels in patients (Parati et al., 2021), hindering efforts to improve the patient's quality of life (Engdahl et al., 2019).

There are several prescribed medications for hypertension in Tanzania; however, data suggests that hypertensive patients do not adhere to these medical treatments, as only 16% of patients in one study were found to have controlled blood pressure (Galson et al., 2017). As a result, a lot of hypertensive patients do not obtain the full benefit of medical treatment, leading to poor health outcomes, decreased quality of life, and higher healthcare costs.

Little is known about the status and factors associated with antihypertensive medication adherence in Tanzania. This study, therefore, aims to determine the status and identify factors associated with adherence to antihypertensive medications among adults attending a referral hospital in Dar es Salaam, Tanzania.

Materials and Methods

Study Design

This was a cross-section design using a quantitative approach. We opted for this study design because it facilitated the identification of factors associated with adherence to antihypertensive medications among hypertensive patients. In addition, our study was time-bound and therefore the choice of the design as it takes a short time to collect and analyze data (Wang & Cheng, 2020).

Study setting

The study was conducted in an outpatient setting at Jakaya Kikwete Cardiac Institute (JKCI) in Ilala district, Dares Salaam. JKCI is a national referral hospital specializing in treating and managing cardiovascular conditions. The hospital receives patients from different parts of Tanzania, allowing a greater diversity of patients to be investigated. The institute has a capacity of about 140 beds and attends an average of 700 outpatients and 100 inpatients per week.

Study population

The study population was adult patients aged (18-64) years attending hypertensive clinics who were available during data collection and who were diagnosed with hypertension and prescribed one or more regular antihypertensive medications at least a month ago.

Inclusion Criteria were

1. The study included patients between 18 and 64 diagnosed with hypertension, with or without any other illness and willing to participate.
2. Participants who were diagnosed with hypertension with or without any other illness and prescribed one or more antihypertensive medications for at least one month were included in the study.

Exclusion Criteria were

Hypertensive patients with other comorbidities or who had other obligations during the data collection period were excluded from the study.

Sampling procedure.

A sampling frame of participants was obtained during a cardiac clinic visit. A simple random sampling procedure using tickets was employed to select the study participants. Participants were asked to draw tickets from a box written YES or NO. Participants who picked tickets with YES from the box were eligible to participate in the study, while those who picked NO were released. Drawing tickets from the box was conducted until the target sample size of 397 participants was achieved.

Data collection

We developed a questionnaire based on the research objectives, the literature review, and the study's conceptual framework. The Kiswahili language version of the questionnaire was used to make it easy for participants to understand the questions. The questionnaire consisted of three sections: XXX questions about socio-demographic information, XXX questions about antihypertensive medication adherence, and XXX questions about factors associated with antihypertensive medication adherence. Questions about antihypertensive medication adherence used a scale ranging from 0 to 8, with a score of less than 6 and greater or equal to 6 reflecting non-adherence and good medication adherence, respectively. To ensure content validity, the questionnaire was examined by a panel of two cardiologists from Jakaya Kikwete Cardiac Institute and the researchers.

Issues of clarity of questions, measurement variables and the relevance of the questionnaire in our Tanzanian context were discussed, and consensus was reached. The questionnaire was pretested to 39 participants to check for face validity, and a few issues about medical terms in the Kiswahili language were addressed to increase clarity. The Reliability of the medication adherence scale was determined by calculating the internal consistency through SPSS. A Cronbach's alphas (α) value of 0.69 was obtained. The questionnaire was self-administered, and participants were required to respond to all questions; the researchers collected the questionnaires after ensuring they were duly filled; all the questionnaires were collected in two weeks.

Data analysis

Completeness of questionnaires was made. SPSS software program version 20 was used to enter and analyze the data. Descriptive statistics were used; frequencies, mean, and standard deviation were calculated. The percentage of medication adherence among study participants was computed to determine the proportion of patients with good adherence. The associations of variables with medication adherence were determined using chi-square. Multiple logistic regression was used to identify the factors that were significantly associated with adherence to antihypertensive medications; a p-value of 0.05 or less was considered statistically significant.

Ethical considerations

Ethical clearance was obtained from the Muhimbili University of Health and Allied Sciences Institutional Review Board (Ref No DA282/298/01.C). Permission to conduct the study at the JKCI was obtained from Ref. No AB.123/307/01D/58. All potential participants received information about the study during their visit to a clinic at the hospital. They were provided information on the potential risks and benefits of participating in the study. They were asked to sign a written informed consent form upon their agreement to participate in the study voluntarily.

Results

Socio-demographic characteristics

379 study participants completed questionnaires, making an effective response rate of 100%. The mean age of the study participants was 56.72(SD ±8.46). Most of the participants were females, 55.94% (212/379). More than a third of participants, 57 (41.42%), had completed primary education. Among the study participants, 85 (22.43%) were employed by either the government or private sector. For details, see Table 1.

Table 1: Socio-demographic characteristics of the participants (n=379)

Characteristics	n	%
Sex		
Female	212	55.94
Male	167	44.06
Age group (years)		
Less than 41	22	5.80
41 to 50	54	14.25
51 to 60	135	35.62
61 and above	168	44.33
Educational attainment		
No formal education	37	9.76
Primary	157	41.42
Secondary	111	29.2
Marital status		
Single	30	7.92
Married	278	73.35
Divorced	12	3.17
Widowed	59	15.57
Occupation		
Employed	85	22.43
Self-employed	96	25.33
Unemployed	198	52.24

**The mean age was 56.72 years, with a standard deviation 8.46. The minimum age was 18 years, and the maximum was 64 years.*

Proportion of antihypertensive medication adherence among study participants

In this study, the proportion of antihypertensive medication adherence among hypertensive patients was 55.40%.

Factors associated with antihypertensive treatment adherence

Multivariate analysis showed that factors such as the use of traditional medicine (AOR=0.08, 95% CI=0.04-0.18), a belief that prayer can cure hypertension (AOR=0.15, 95% CI= 0.09-0.27), having health insurance (AOR=2.97, 95%CI=1.07-8.30) and unsatisfactory interactions with pharmacy service (AOR=0.57, 95%CI= 0.33-0.98) were significantly associated with adherence to antihypertensive medications. Levels of education had statistically significant associations with medication adherence but complex, respondents who had primary education (AOR= 2.08, 95%CI=1.08-4.03) and college/university (AOR=3.11, 95%CI= 1.38-7.00). On the other hand, factors such as age, occupation, use of table salt, alcohol consumption, and medication costs were not statistically significantly associated with antihypertensive medication adherence (Table 2).

Table 2: Bivariate and multivariate analysis of factors associated with antihypertensive medication adherence

Variables	Bivariate		Multivariate	
Categories	**COR (95% CI)**	**P Value**	**AOR (95% CI)**	**P value**
Age group (years)				
61 and above	1		1	0.531
51 to 60	0.35 (0.14-0.88)	0.026	0.64 (0.16-2.54)	0.574
41 t0 50	0.49 (0.26-0.92)	0.025	0.76 (0.30-1.94)	0.788
Less than 41	0.75 (0.47-1.18)	0.213	1.09 (0.56-2.16)	
Level of education				
Secondary	1		1	
No formal	1.92 (0.90-4.10)	0.090	2.47 (0.87-6.97)	0.088
Primary	2.18 (1.33-3.58)	0.002	2.08 (1.08-4.03)	0.029
College/University	1.72 (0.95-3.12)	0.073	3.11 (1.38-7.00)	0.006
Occupation				
Retired/Unemployed	1		1	
Employed	0.50 (0.30-0.84)	0.009	0.67 (0.28-1.59)	0.362
Self employed	0.80 (0.49-1.31)	0.378	0.74 (0.37-1.48)	0.392
Use of Table salt				
NO	1		1	
YES	0.39 (0.23-0.66)	0.001	0.68 (0.33-1.38)	0.284
Use of Traditional Medicine				
NO	1		1	
YES	0.09 (0.04-0.18)	<0.001	0.08 (0.04-0.18)	<0.001
Use of Alcohol				
NO	1		1	
YES	0.24 (0.11-0.28)	<0.001	0.40 (0.15-1.10)	0.077
Prayers can cure hypertension				
Disagree				
Agree	1		1	

	0.17 (0.11-0.28)	<0.001	0.15 (0.09-0.27)	<0.001
Health Insurance				
YES	1		1	
NO	1.77 (0.81-3.86)	0.154	2.97 (1.07-8.30)	0.037
Unaffordable Medication Cost				
NO	1		1	
YES	0.71 (0.43-1.19)	0.193	0.88 (0.44-1.74)	0.713
Pharmacy service Satisfaction				
YES	1		1	
NO	0.48 (0.32-0.73)	0.001	0.57 (0.33-0.98)	0.042

Discussion

Our study found that adherence to antihypertensive medications was low. This finding aligns with previous studies conducted in three districts, Temeke, Ilala, and Kinondoni of Dar Es Salaam, and from north India in District Ambala (Joho, 2012; Nazir et al., 2020). However, the finding is lower than in Gondar Town and Debre Markos Town in Northwest Ethiopia (Ambaw et al., 2012; Mekonnen et al., 2017). This might be due to differences in socio-demographic characteristics and care improvement programs for hypertensive patients in northwest Ethiopia, which resulted in over half of the study participants receiving medications for free.

On the other hand, this study's findings are higher than those of Teaching Hospital Janna in Northern Sri Lanka, Nedjo General Hospital, and Nedjo Town in West Ethiopia (Berisa & Dedefo, 2018; Pirasath et al., 2017). This difference could be due to small sample sizes in West Ethiopia and differences in sampling methods in Sri Lanka, so these differences might be due to bias because this study used simple random sampling.

However, in a study done in Sri Lanka, the eligible participants were selected using a systematic randomized controlled sampling method. Also, because patients participating in the Sri Lankan study were unaware that control of high blood pressure is important, they identified that doctors did not emphasize the significance of uncontrolled hypertension. In contrast, in this study, most participants reported being educated by their physicians on the importance of managing their hypertension. This observation implies that if the Ministry of Health could make interventions to develop and strengthen the national health care system and provide better access to health care services, it could help to improve adherence to antihypertensive medications.

This study identified that the use of traditional medicine was significantly associated with poor adherence to antihypertensive medications. Hypertensive patients who reported the use of traditional medicine were less likely to be adherent to their antihypertensive medications. This finding is supported by a study in twelve low and middle-economic countries in Sub-Saharan Africa (Macquart et al., 2019). Since hypertension has no cure, patients use prescribed antihypertensive medications to control hypertension only and not to be cured; due to this, some patients find traditional medicine as an alternative way to seek a cure for hypertension. This misconception leads to poor adherence to antihypertensive medication. These results suggest that interventions aimed at providing health education about hypertension and the importance of good antihypertensive medication adherence can help good adherence.

The finding from this study revealed that poor hospital pharmacy service was significantly associated with adherence behaviour. Patients who were reported to be unsatisfied with pharmacy service were less likely to adhere to antihypertensive medications than patients who were reported to be satisfied with hospital pharmacy service. Long waiting times are a problem that patients frequently identify. Patients reported waiting over three hours to collect their medications from the hospital pharmacy. Patient dissatisfaction with pharmacy service and efficiency is directly related to waiting times; excessive waiting time can lead to poor compliance with prescribed medication use (Afolabi & Φ, 2003). In this study, some patients complained about receiving fewer doses of the prescribed tablet from hospital pharmacies than their doctors had ordered. The smaller number of dispensed tablets will likely reduce adherence to antihypertensive medication. These results highlight the need for interventions to improve pharmacy services for hypertensive outpatients.

Having a belief that prayers can cure hypertension was a significant independent factor associated with poor adherence to antihypertensive medications. This finding is comparable to a study done in Saudi Arabia (Alsolami et al., 2012). This study identified that hypertensive patients who had a belief that prayers can cure hypertension were less likely to adhere to antihypertensive medications than those who had no such belief. Religious belief has long contributed to medication adherence practices; Christians believe that God is omnipotent and a healer; he can heal all their diseases, including hypertension. Some Muslim patients do not take antihypertensive medications because they believe that their sickness is predetermined by Allah (God) and, therefore, are not required to be treated with medication (Griffiths et al., 2005). These results imply that interventions that provide health education about hypertension and the importance of good antihypertensive medication adherence while understanding patient beliefs can help good adherence.

Having health insurance was a statistically significant independent factor associated with poor adherence to antihypertensive medications. This finding is incomparable with the study done in Mwanza by (Maginga et al., 2016), which showed that health insurance is insignificantly associated with poor adherence to antihypertensive medication. Also, it is not in line with the other studies in Nova Scotia, which revealed that lack of health insurance can affect adherence to antihypertensive medication (Natarajan et al., 2013; Vawter et al., 2008). A possible explanation for the difference might be that in this study, there were very few patients who reported a lack of health insurance. Among them, only ten showed non-adherence to antihypertensive medication.

The strength of the study lies in the fact that we collected data from a national referral hospital specializing in cardiovascular conditions, which receives patients from different parts of Tanzania; this allowed a greater diversity of patients to be investigated than in a regional or local centre, together with a good sample size, our findings may be more confidently applied to hypertensive patients throughout Tanzania and other settings similar settings.

Our study had several limitations, including using a self-reporting method to measure medication adherence; this method is subjected to recall bias from respondents, leading to overestimating the adherence rate. Second, participants who were diagnosed with hypertension and prescribed one or more antihypertensive medications for at least one month were included in the study; sometimes, this can lead to an overestimation of the adherence rate because just a month may not be enough to determine if the patient is real adhering to antihypertensive medication. After all, taking hypertensive medications is lifelong for hypertensive patients. The last limitation is using a self-developed questionnaire, although we tested it for internal consistency and reliability.

Conclusion

The study showed that only 55.40% of patients had good adherence to antihypertensive medication, which was observed to be low. Factors such as the use of traditional medicine, believing that prayer

can cure hypertension, unsatisfactory experience with pharmacy services, and having no health insurance were significantly associated with poor adherence to antihypertensive medications. To improve hypertension control among patients, healthcare providers and policymakers should address these factors by identifying and implementing patient-centred strategies.

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Conflicts of interests: Authors declare no competing interests.
Authors' contribution: AM conceptualized the study, collected, analyzed, and drafted the manuscript, and BM and MN guided data collection and reviewed the manuscript. All the authors approved the final manuscript.
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