EAHRC
EAST AFRICAN HEALTH RESEARCH COMMISSION
Research for Health and Prosperity

ORIGINAL ARTICLE

Herbal Medicine Use and its Associated Factors Among Patients With Chronic Kidney Disease at Muhimbili National Hospital, Dar es Salaam, Tanzania

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ABSTRACT

Background: Herbal medicines are widely used globally despite concerns about their potential nephrotoxic effects. This study assessed the prevalence of herbal medicine use and associated factors among patients with chronic kidney disease (CKD) attending Muhimbili National Hospital (MNH).

Methods: A cross-sectional study was conducted among 331 CKD patients attending the MNH renal outpatient clinic between March and June 2022. Data were collected using a self-administered Swahili questionnaire on socio-demographic characteristics, knowledge, attitudes, and herbal medicine use.

Results: The median age of participants was 50 years (IQR: 31 to 61), with 174 females and 157 males enrolled. Herbal medicine use was reported by 23.0% of participants. Rural residence (Apr 1.6; 95% CI, 1.10 to 2.34; *P*=.019) and a good attitude toward herbal medicines (aPR 1.5; 95% CI, 1.01 to 2.34; *P*=.043), were independently associated with herbal medicine use.

Conclusion: Herbal medicine use was common among CKD patients. Rural residence and positive attitudes toward herbal medicines were significant predictors of use. Routine screening, patient education, and counselling on herbal medicine use should be incorporated into CKD care.

BACKGROUND

Chronic Kidney Disease (CKD) is a global public health problem in both developed and developing countries. Low- and middle-income countries, notably those in sub-Saharan Africa, are particularly hard hit.[1–3] Use of herbal medicines in healings has gained ground among patients with chronic conditions including CKD.[4,5] According to the WHO, more than 75 to 80% of the world's population is using herbal medications to treat various chronic conditions, prevention of evil spirits, boost mental capacity and for other day to day human activities.[6,7,8]

In Sub-Sahara Africa, it is estimated that more than 80% of the population uses herbal medicines and in Tanzania alone more than 60% of its population is using herbal medicines to meet their primary health care needs.[9,10,11] Although previous studies have shown that many users of herbal medicines were unaware of their potential short- and long-term adverse effects, the specific reasons for herbal medicine use among patients with chronic kidney disease (CKD) remain unclear. Additionally, recent evidence indicates that certain herbal medicines contain nephrotoxic compounds that may contribute to kidney damage and are associated with various renal disorders, including acute kidney injury and chronic kidney disease.[12,13]

The use of herbal medicines among individuals with impaired renal function contributes significantly to the progression to End-Stage Renal Disease (ESRD), which necessitates Renal Replacement Therapy for survival.[14] In Africa, more than 35% of acute renal failure cases are linked to the use of herbal medicines, resulting in high morbidity and mortality rates.[15] Stanifer et al reported a high prevalence of herbal medicine use among patients with CKD in Tanzania; however, the factors underlying this widespread use remain largely unknown.[16] Therefore, this study aimed to determine the magnitude of herbal medicine use and its associated factors among CKD patients attending the outpatient clinic at Muhimbili National Hospital, Dar es Salaam, Tanzania.

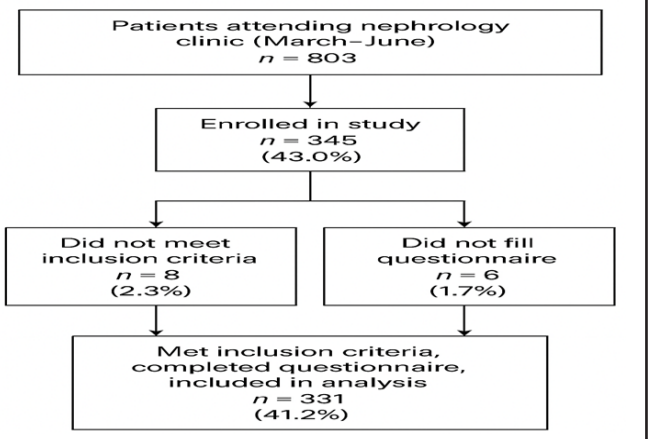
METHODS

This hospital-based descriptive cross-sectional study was conducted among adults aged 18 years and older with chronic kidney disease (CKD) attending the nephrology outpatient clinic at Muhimbili National Hospital (MNH), Dar es Salaam.

MNH is Tanzania's national referral and teaching hospital with a bed capacity of about 2,000, serving as a tertiary referral facility and training center for Muhimbili University of Health and Allied Sciences (MUHAS). The nephrology clinic operates weekly on Wednesdays and is staffed by six nephrologists, eight nephrology fellows, and one medical officer, with an average attendance of 60 patients per clinic.

Sample size was determined using G*Power software, based on a 70.3% prevalence reported in a previous study from Northern Tanzania. A total of 345 patients were approached, 331 met inclusion criteria and consented to participate, while 14 were excluded or declined as shown in Figure 1.

FIGURE 1: Participant's Flow Chart



Inclusion Criteria

Adult patients (≥18 years) with a confirmed diagnosis of chronic kidney disease attending the CKD clinic at Muhimbili National Hospital during the study period, who were able to communicate in Kiswahili or English and provided written informed consent.

Exclusion Criteria

Patients with other significant health problems such as those with compromised pulmonary functions requiring oxygen and those requiring assistive devices which limit them to communication.

Sampling Technique

Participants were selected through systematic random sampling from clinic registries from March to June 2022. Data were collected using a structured self-administered Swahili questionnaire which was reviewed by nephrologists and was pretested to 30 patients who were not included during analysis. To ensure consistency, we administered the same questionnaires to the same patients on their second follow up clinic and responses were the same.

Data were analyzed using SPSS version 23. Descriptive statistics were presented in frequency tables, and categorical variables were examined using Chi-square tests. Variables with $P<.2$ were entered into regression models to identify independent predictors, with statistical significance set at $P<.05$. Ethical approval was obtained from the Muhimbili University of Health and Allied Sciences Institutional Review Board, with approval number (MUHAS-REC-03-2022-1001) and permission granted by MNH administration. Confidentiality was maintained throughout.

Note: Herbal medicine use was a binary outcome with high prevalence, making prevalence ratios more appropriate than odds ratios. Because log-binomial models may experience convergence problems, Poisson regression with robust standard errors was used to estimate adjusted prevalence ratios and identify associated factors while controlling for confounders.

RESULTS

The median age of the participants were 50 years (IQR 31–61), 52.6% were female, 75.8% lived with partners, 86.7% had formal education, 76.4% were unemployed, and 88.5% resided in rural areas Table 1.

TABLE 1: Socio-demographic characteristics Of the Study Population

Variable	Frequency (N = 331)	Percent (%)
Age group (years)		
Young adult (18 – 44years)	131	39.6
Older adults (45 years and above)	200	60.4
Median age in years (IQR)	50(39,61)	
Sex		
Male	157	47.4
Female	174	52.6
Level of education		
No formal education	44	13.3
Formal education	287	86.7
Occupation status		
Unemployed	253	76.4
Employed	78	23.6
Marital status		
Living with partner	251	75.8
Living without partner	80	24.2
Permanent place of residence		
Rural	293	88.5
Urban	38	11.5

Prevalence of Herbal Medicine Use Among Patients With CKD

The prevalence of herbal medicine use among patients with CKD as shown in Table 2 is 23.0% (76/269).

Factors Associated With Herbal Medicine Use

A total of eight (8) potential variables were identified after performing a univariate regression analysis. Backward elimination method reduced these variables to four (4) parameters as shown in Tables 3 and 4 present the factors associated with herbal medicine use following adjustment for marital status, place of residence, health insurance status, and attitude toward herbal medicines using Poisson regression analysis.

TABLE 2: Prevalence of Herbal Medicine Use Among Patients with Chronic Kidnay Diseases (N=331)

	Ever used n (%)	Used within two months n (%)
Yes	265 (80.1)	76(23.0)
No	66(19.9)	255(77.0)
Total	331	331

A backward elimination approach was employed to develop the final model, as it facilitates the identification of independent predictors, controls for potential confounding, reduces the inclusion of non-informative variables, and yields a more parsimonious model.

Marital status, Place of Residence, Health insurance coverage, and Attitude towards herbal medicines and their relationships with use of herbal medicines.

TABLE 3: Factors Associated with Herbal Medicine Use Among Patients With Chronic Kidney Disease, (N=331)

Variable	Used Herbs Within Two Months Yes (%)	No (%)	Degree of freedom) df	Chi square	*P Value*
Age group (yrs.)			1	0.01	
Young adult	16(23.9)	51(76.1)			.930
Older adult	46(23.6	151(76.7)			
Sex			1	1.12	
Male	32(20.4)	125(79.6)			.289
Female	44(25.3)	130(76.7)			
Level of education			1	0.5	
No formal education	12(27.3)	32(72.7)			.465
Formal education	64(22.3)	223(77.7)			
Occupation status			1	0.80	
Employed	15(19.2)	63(80.8)			.370
Unemployed	61(24.1)	192(75.9)			
Marital status			1	4.1	
Living without partner	50(20.0)	199(80.0)			.030
Living with partner	26(31.7)	56(68.3)			
Place of residence			1	4.7	
Urban	43(18.4)	191(81.6)			.002
Rural	33(34.0)	64(66.0)			
Health insurance coverage			1	7.1	
Not insured	69(25.6)	201(74.4)			.018
Insured	7(11.4)	54(88.5)			
Attitude toward herbs			1	5.2	
Poor	58(20.7)	222(79.3)			.023
Good	18(35.3)	33(64.7)			

TABLE 4: Determinants of Herbal Medicine Use (N=331)

Variable/ Category	cPR	95% CI	*P Value*	aPR	95% CI	*P Value*
Marital status						
Living with partner	1.6	1.06 – 2.36	.026	1.4	0.92 – 2.07	.120
Living without partner	Ref					
Residence						
Rural	1.9	1.26 – 2.73	.002	1.6	1.10 – 2.34	.019
Urban	Ref					
Health insurance						
Not insured	2.2	1.08 – 4.60	.031	1.9	0.90 – 3.98	.091
Insured	Ref					

Continue

TABLE 4: Continued

Variable/Category	cPR	95% CI	*P Value*	aPR	95% CI	*P Value*
Attitude towards herbal medicines						
Good	1.7	1.10 – 2.64	.017	1.5	1.01 – 2.34	.043
Poor	Ref					

Abbreviations: cPR, crude Prevalence Ratio; aPR, adjusted Prevalence Ratio; Ref, Reference category.

DISCUSSION

This study was conducted at Muhimbili National Hospital to determine use of herbal medicine among CKD patients attending nephrology clinic. This study found that marital status, residence, health insurance, and attitudes toward herbal medicines were associated with herbal medicine use among patients with chronic diseases. However, the safety and adverse effects of these medicines remain inadequately established, posing potential public health risks due to limited knowledge and weak regulatory frameworks. [17]

Factors such as place of residence and personal attitude towards herbal medicines were noted to significantly influence use of herbs among participants in this study. However, after adjusted analysis models which controlled potential confounding variables, place of residence and attitude towards herbal medicines were isolated as statistically significant variables influencing use of herbal medicines among patients with CKD.

The high prevalence of herbal medicine use among CKD patients, with 80% reporting lifetime use and 23% reporting recent use, highlights the need to integrate routine screening for herbal medicine use into CKD care services. Healthcare providers should be trained to assess and document herbal medicine use and provide appropriate counselling on potential risks and interactions. At the policy level, national guidelines should strengthen the regulation, monitoring, and public education surrounding herbal medicine use, particularly among patients with chronic illnesses. Additionally, collaboration between conventional healthcare providers and traditional medicine practitioners may promote safer and more coordinated patient care.[18] The findings of this study are consistent with evidence from Tanzania. A study by Liwa conducted at a zonal consultant hospital in the Lake Zone reported similar patterns of herbal medicine use among patients admitted with hypertension, with 76% reporting lifetime use and 24% reporting use within one month prior to admission. These comparable findings suggest that herbal medicine use remains common among patients with chronic diseases in Tanzania, underscoring the importance of routinely assessing herbal medicine use during clinical care. [15] Herbal medicines are widely accessible and are frequently used for treatment of various conditions, including chronic disorders. However, they have also been reported to contribute to kidney disorders and may worsen existing kidney diseases. [19] Raising awareness on the effects on this medicine is important among CKD patients who have been reported to be willing to use herbal medicine in Tanzania.[20]

Participants residing in rural areas were more likely to use herbal medicines than their urban counterparts, likely due to limited access to formal healthcare services in rural settings. The scarcity of healthcare facilities, coupled with the greater availability, affordability, and cultural acceptance of traditional medicine, may contribute to increased reliance on herbal remedies as a primary source of healthcare.[21] Traditional medicine has been reported to contribute up to 90% of primary health care in sub-Saharan African countries.[22,23,24,25]

High cost of health care is one of the drivers of utilization of herbal medicines, this is reflected by the high utilization of herbal medicine among participants who had no health insurance in this study which is similar to report by Liwa et al from a study conducted in similar setting [15]. Raising the cost of treatment was reported by Hughes et al in South Africa to have an influence on the increased use of traditional medicine for treatment of non-communicable diseases among people without health insurance.[26,27] The cost of treatment of kidney diseases is high in Tanzania as was documented by Furia et al. that the average price of as single session of hemodialysis to be between USD 120-150 for cash paying patients. [28,29] Liwa et al reported that participants living with partners were facing pressure from their spouses to seek different treatment options including taking herbal medicines for diseases prevention and treatment. [13]

Utilization of herbal medicines is affected by attitude towards herbal medicines of patients and health care providers, Logiel et al reported health care providers attitude to influence perception of these medicines. [26] Patient's attitude was assessed in this study and it was noted that herbal medicines were mostly used by those who considered them to be safe. Participants with higher education were less likely to use herbal medicine, this may be attributed to the possibility of knowing the possible adverse effects of this medicine, and furthermore they are more likely to have access to health care. Some studies have reported higher utilization among educated people indicating the complexity of the factors influencing behavior of patients.[26]

Study Limitations

Temporal ambiguity: Exposure and outcome were measured simultaneously, and it was not possible to know which came first. Example; if a patient uses herbal medicine and has advanced CKD, you cannot tell if herbal medicine use contributed to CKD progression or if CKD led them to use herbal medicines.

Social desirability bias: Herbal medicine use was self-

reported, which may be affected by social desirability bias. Some participants might have underreported or overreported their use due to perceived social or medical expectations.

Recall bias: The measurement of herbal medicine use within the previous two months was subject to potential recall bias, since some participants may have had difficulty accurately recalling when they last used herbal medicines.

Lack of herbal medicines verification: This study did not include laboratory verification, chemical analysis, or identification of the specific herbal products used by participants, which may have introduced information bias and limited the accuracy of herbal medicine classification.

Generalizability: Single site (MNH) is a tertiary referral hospital; findings may not apply to primary care or community CKD patients.

Social desirability bias: For your CKD herbal medicine study, social desirability bias may have occurred because some participants may have underreported herbal medicine use because they believed healthcare providers might disapprove it, or overreported positive health behaviors to appear compliant with medical advice.

CONCLUSION

Herbal medicine use was common among CKD patients attending Muhimbili National Hospital, with rural residence and positive attitudes toward herbal medicines identified as significant predictors of use. Given the potential risks associated with herbal medicine use in patients with impaired kidney function, routine screening for herbal medicine use should be integrated into CKD care.

Healthcare providers should strengthen patient education and counseling on the potential benefits and risks of herbal medicines, while policymakers should develop guidelines and awareness programs to promote safe use and improve communication between patients and healthcare professionals regarding herbal medicine practices.

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Peer Reviewed

Acknowledgements: Special thanks go to patients with CKD attending nephrology clinic at Muhimbili National Hospital (MNH) for their willingness to participate in this study and doctors and nurses for their support during data collection. I should also thank the hospital administration for a favorable environment to conduct my research as well as supporting my master's degree.

Competing Interests: Authors declare no competing interest.

Funding: The study did not receive any funding.

Received: 18 November 2025; **Accepted:** 02 Jjuly 2026

Cite this article as Wandwe O, Morris B, Furia FF. Herbal medicine use and its associated factors among patients with chronic kidney disease at Muhimbili National Hospital, Dar es Salaam, Tanzania. *East Afr Health Res J.* 2026;10(2):272-277. https://doi.org/10.24248/eahrj.v10i2.348

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