



Assessment of Nurses' Contribution, Knowledge, Attitude and their Practices in Effective Management of Acute Kidney Injury at Gihundwe District Hospital, Rwanda

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Abstract

Background: Acute Kidney Injury (AKI) is a critical condition with significant implications for patient outcomes. The role of nurses in the management of AKI is vital, encompassing early detection, monitoring, and intervention. This study aims to assess the contribution, knowledge, attitudes, and practices of nurses at Gihundwe District Hospital regarding AKI management. The purpose of study is to assess nurses' contribution, knowledge, attitude, and practice among in effective management of AKI at Gihundwe District Hospital.

Methods: A descriptive cross-sectional study was conducted using structured questionnaires distributed to 89 nurses at Gihundwe District Hospital. Data analysis was performed using STATA software Version 15, focusing on demographic characteristics, contributions, knowledge, attitudes, and practices related to AKI management.

Results: The study found that the majority of respondents were aged 20-30 years (57.3%), predominantly female (52.81%), and held a Diploma in Nursing (57.3%). 84.27% of nurses consistently contributed to AKI management, indicating high engagement levels. 55.06% had excellent knowledge of AKI causes, and 84.27% were familiar with management guidelines. All respondents were aware of common AKI symptoms. A significant majority (92.13%) considered evidence-based guidelines very important, and 87.64% strongly believed in the crucial role of nurses in AKI management. There was a high demand for further training (88.76%). 89.89% always assessed kidney function in at-risk patients using comprehensive methods. Preventive measures were consistently implemented by 91.01% of nurses. Major challenges included insufficient training (25.84%) and lack of resources (13.48%). Key factors associated with effective management of kidney injuries include the practice of frequent assessment of kidney function in at-risk patients (p: 0.008), use of common methods in monitoring kidney functions (p: 0.018, implementation of preventive measures (p: <0.01), and collaboration between healthcare professionals (p: 0.003).

Conclusion: So the Nurses at Gihundwe District Hospital exhibit strong engagement, substantial knowledge, and positive attitudes towards AKI management. However, there is a need for enhanced training and better resource allocation to address the challenges faced. These findings provide a basis for targeted interventions and training programs to improve AKI management and patient outcomes.

Keywords: Acute Kidney Injury; Nurses; Contribution; Effective; Management; Knowledge; Attitudes; Practices; Gihundwe District Hospital

Abbreviations

AKI: Acute Kidney Injury; LMIC: Low Middle Income Countries; LIC: Low Income Countries; SSA: Sub-Sahara Africa; ESRD: End-Stage Renal Disease; CKD: Chronic Kidney Disease; KHA: Kidney Health Assessment; ACEI: Angiotensin Converting Enzyme Inhibitor; ARB: Angiotensin Receptor Blocker; RRP: Renal Replacement Therapy; KIDIGO: Kidney Disease Improving Global Outcome; HBM: Health Belief Model

Introduction

The background

Acute Kidney Injury (AKI) is defined as the abrupt loss of renal function, resulting into retention of waste products, electrolyte disturbances, and volume status changes that characterized by adequate urine output of less than 0.5ml/kg/hour in six hours, this resulting the long-term effect including the developing of chronic kidney disease (CKD) and end-stage renal disease (ESRD) that require dialysis [1]. Acute Kidney Injury (AKI) is associated with substantial morbidity and mortality, it can be reversible when detected early means before 3months. It can be hospital acquired when developed after admission to the hospital and community acquired when occurred in the community or before admission. The hospital acquired Acute Kidney Injury(AKI) are more common in developing countries and in older patients (45-80) while community acquired AKI are more common in low income countries and in younger populations [2].

Acute kidney injury is a common worldwide public health problem and it remains a poorly diagnosed disease in the world, globally it is estimated as 13.3 million cases per year, with 85% from low-middle income countries (LMIC) [3]. Recent Meta -analysis only 154 studies were done on acute kidney injury with only 2 studies done in Africa, the results showed 21% in adults and 33.7% in children, mortality was 23.3% in adults and 13.8% in children [2].

In developed countries hospital acquired AKI is the most common with prevalence of 7-18%, and more in elderly people while community acquired AKI is the most common in low-income countries and more in children [4]. As well in the developing countries, the limited resources regarding diagnosis, treatment, and trained health professional influence the burden of the condition. The deficiency in qualified professional can delay and timely identification and management, including the specialized services, leading to a worsening prognosis [5].

A study in South Africa showed that the prevalence of acute kidney injury to be 14.7% in old people, combining both community-acquired and hospital-acquired acute kidney injury [6]. The same study shows that hospital-acquired acute kidney is at 6.2%, where the most common reasons are infection, hypertension, and surgery [5]. In sub-Saharan Africa study done by Wasiu., *et al.* showed that most common causes of AKI is infections with 28%, nephrotoxins 18%, pregnancy related causes 16%, glomerular disease 8%, and volume loss 5% [4].

In Sub-Sahara Africa (SSA), the studies were done findings is unknown. In Ethiopia study done and published in June 2024 [7] showed that among the total study participants, 128 (40.4%) developed Acute Kidney Injury (AKI). The incidence rate of Acute Kidney Injury was 30.1 (95% CI: 25.33, 35.8) per 1000 person-days of observation, with a median survival time of 23 days. It was found that patients with invasive mechanical ventilation (AHR = 2.64; 95% CI: 1.46-4.78), negative fluid balance (AHR = 2.00; 95% CI: 1.30-3.03), hypertension (AHR = 1.6; 95% CI: 1.05-2.38), and a vasopressor (AHR = 1.72; 95% CI: 1.10-2.63) were independent predictors of acute kidney injury [8].

In Tanzania study done and published in July 2021 showed that More than half (55.3%) of ICU patients were diagnosed with AKI of these, 80% were diagnosed within 24 hours of admission [9]. Acute kidney injury stage 3 accounted for 35% of patients with AKI. Patients with AKI were older, more likely to have cardiovascular comorbidities, and with higher baseline serum levels of creatinine, potassium, universal vital assessment admission scores, and total white cell count ≥ 12 . Sepsis (odds ratio [OR] = 3.81; confidence interval [CI] = 1.21-11.99), diabetes (OR = 2.54; CI = 1.24-5.17), and use of vasopressors (OR = 3.78; CI = 1.36-10.54) were independently associated with AKI in multivariable logistic regression. Less than one-third of those who needed dialysis received it. There was 100% mortality in those who needed dialysis but did not receive (n = 19) [9].

In Uganda study done and published in January 2015 showed that in 387 patients recruited, 217 (55.6%) were male and the average age was 37 years (range 18-90 years). The prevalence of sepsis-related AKI was 16.3%. Age >59 years (p = 0.023), a postural drop in systolic blood pressure of >9 mmHg (p = 0.015) and a white blood cell count >12,000 cells/mL (p = 0.003) were signifi-

cantly associated with AKI. In-hospital mortality among patients with AKI was 21% (13/63). 59% (20/49) of patients who were discharged alive or were still on the wards after 2 weeks had persistent kidney injury. Acute Kidney Injury Network (AKIN) Stage 3 was significantly associated with persistence of kidney injury ($p = 0.001$). None of the patients requiring dialysis or ICU care received either because of limited access [10].

In Rwanda study done and published in March 2018 showed that infectious causes AKI at 35.1%, pregnancy related 26.9%. Pulmonary edema was the most common indication of hemodialysis with 54.9% and uremic encephalopathy 50%, the mortality was 34% [11]. Also in Rwanda especially at gihundwe district hospital a study evaluating hospital's challenges in knowledge, contribution and management of acute kidney injury in resource-limited settings, mentioned knowledge gaps among the health professionals, including nurses. Therefore this study intended specifically assess the nurses contribution, knowledge, altitude and practices in management of AKI in Rwanda [5].

Purpose

The main objective of this study is to assess Nurses' contribution, knowledge, attitude to practice in effective management of acute kidney injury at Gihundwe District hospital.

Significant of the study

A study conducted in Rwanda's referral hospitals revealed that most nurses lack knowledge about acute kidney injury (AKI). The findings were helpful in increasing efforts on renal disorders, particularly in medical surgical courses. The researchers gained valuable information about the knowledge, attitude, and practices of nurses in managing AKI, which could be used to improve modern management. The study was used as a teaching tool at Kibogora Polytechnic University, helping to plan AKI management outreach for community health improvement. The Gihundwe district hospital in Rwanda identified gaps in AKI management and took appropriate measures based on the findings. The Rwandan government also made strategic planning to help AKI patients and improve current support methods. This could help introduce policies and procedures to improve AKI management in Rwanda.

Methods

Research design

This study was quantitative approach. Researchers were interested in this approach to quantify and analyze the data collection and qualitative approach was applied to assess the contribution, knowledge, attitude and practices of nurses regarding management of acute kidney injury (AKI) in Gihundwe district hospital. While study design was cross-sectional, the data was conducted from 02 July up to 10 August 2024

Study setting

Target population

The study target population was 89 registered nurses working in emergency, surgery, internal medicine and dialysis services at Gihundwe district hospital located in Gihundwe sector, Rusizi district.

Sampling procedures

The study aimed to analyse the contribution, knowledge, attitudes, and practices of 89 registered nurses working in emergency, surgery, internal medicine, and dialysis services at Gihundwe District Hospital. A non-probability convenient sampling was followed to ensure a representative sample. The list of nurses was obtained, and the inclusion criteria were those currently employed and actively working in the specified departments. Nurses on extended leave or who declined participation were excluded. A non-probability convenient sampling technique was employed to select the sample.

The sample size was determined at 89 nurses to ensure comprehensive data collection and analysis.

Including the entire target population in the study provided several advantages, including comprehensive data, minimizing bias, and maximizing participation. This approach ensured robust and generalizable findings, minimized selection bias, and enhanced the reliability of the study results. By involving all eligible nurses, the study maximized participation and the richness of the collected data. The study aimed to achieve accurate and reliable insights into the contribution, knowledge, attitudes, and practices of nurses regarding the management of acute kidney injury at Gihundwe District Hospital.

Therefore, the sample size was the same as target population due to the low number of target population we decided to include all target population in our study.

Research instruments for data collection

A structured questionnaire was used as data collection instrument. Knowledge, attitude and practice of nurses toward AKI management, assessed by using self-administered questionnaire. The questionnaire adopted from the study done by Kamunge and her colleagues; where they were exploring the knowledge, attitude and practice of registered nurses regarding AKI prevention and control [12]. The questionnaire assessed the knowledge and attitude of nurses regarding management of AKI and the observational checklist was used to assess the nurses' practice. The questionnaire was being in English version (refer to the tool in [Appendix 1](#)).

Data collection procedures

After getting a permission letter from Kibogora Polytechnic to conduct the study, we have been submitted it to Gihundwe hospital administration in order to be approved, and then we present approved letter to the head of departments (emergency, surgery, internal medicine and dialysis wards), who, in turn, allowed us to conduct the research as well.

Ethical issues

It is understandable what plagiarism entails and are aware of the University's policy in this regard, any attempt to collect data, ethical clearance has obtained from Institutional Review Board of Kibogora polytechnic. The participants were informed that participation is voluntary and that they have the right to refuse to participate or stop from participating in the study any time they may experience any discomfort without any consequence. Only those who accept to participate did so by signing the consent form attached herewith ([Appendix 1](#)) they have been ensured the anonymity and confidentiality of the information that they have been provided.

Data analysis

In order to present the results of the study to be undertaken in a meaningful form, the data was edited, coded and entered into a computer then analyzed through sub-processes classification and tabulation by using STATA version 15. Collected data transformed into frequencies and percentages that facilitated the task using descriptive statistics. A Fischer test was used to identify presence and strength of association between independent and dependent

variables. A confidence interval of 95% and a p-value of less than 0.05 were considered for an association to be statistically significant.

Results

Demographical characteristics of respondents

Demographical characteristics of respondents are critical components in any research study, providing essential context and insights into the population being studied. These characteristics include variables such as age, gender, education level, marital status, occupation, income, and other socio-economic factors. Analyzing these demographics helps researchers understand the diversity and representativeness of their sample, allowing for more accurate interpretations and generalizations of the findings.

In the context of healthcare research, understanding the demographical characteristics of respondents is particularly important. It can highlight how different demographic groups perceive and interact with health services, manage health conditions, and respond to interventions. For instance, in a study assessing the knowledge, attitudes, and practices of nurses in managing Acute Kidney Injury (AKI) at Gihundwe District Hospital, examining the demographic profiles of the nurses can reveal patterns that might influence their professional behavior and the effectiveness of their patient care.

This section aims to describe the demographical characteristics of the respondents in detail, providing a comprehensive overview of the population under study. By presenting this information, we can better appreciate the context within which the study's findings are situated and explore how these characteristics may impact the outcomes of interest. Understanding the demographics also facilitates comparisons with other studies and helps in tailoring interventions to meet the specific needs of different groups within the population.

The demographic data reveals that the majority of respondents are aged 20-30, with females comprising 52.81% and males accounting for 47.19% (Table 1). The majority hold a Diploma in Nursing (57.3%), while the majority have 0-5 years of experience. The Emergency department has the highest number of respondents (49.44%), followed by the Surgical Ward (33.71%) and Medical Ward (10.11%). Other departments and the Intensive Care Unit (ICU) have smaller percentages (4.49% and 2.25%, respectively). Further details and insights are available upon request.

Variables	Description	Frequencies	Percentage (%)
Age	20-30	51	57.3
	31-40	29	32.58
	41-50	7	7.87
	51-60	2	2.25
Gender	Female	47	52.81
	Male	42	47.19
Educational Level	Bachelor's Degree in Nursing	38	42.7
	Diploma in Nursing	51	57.3
Year of experience as nurse	0-5 years	62	69.66
	11-15 years	6	6.74
	16-20 years	2	2.25
	6-10 years	19	21.35
Department/Unit	Emergency	44	49.44
	Intensive Care Unit (ICU)	2	2.25
	Medical Ward	9	10.11
	Other	4	4.49
	Surgical Ward	30	33.71

Table 1: Demographic characteristics of the respondents.

Source: Primary data, 2024

Presentation of findings based on objectives

Evaluation of Nurses' Contribution to the Effective Management of Acute Kidney Injury at Gihundwe District Hospital.

This figure 1 demonstrates that the majority of nurses at Gihundwe District Hospital are highly engaged in the effective management of AKI, with 84.27% always contributing. This high level of

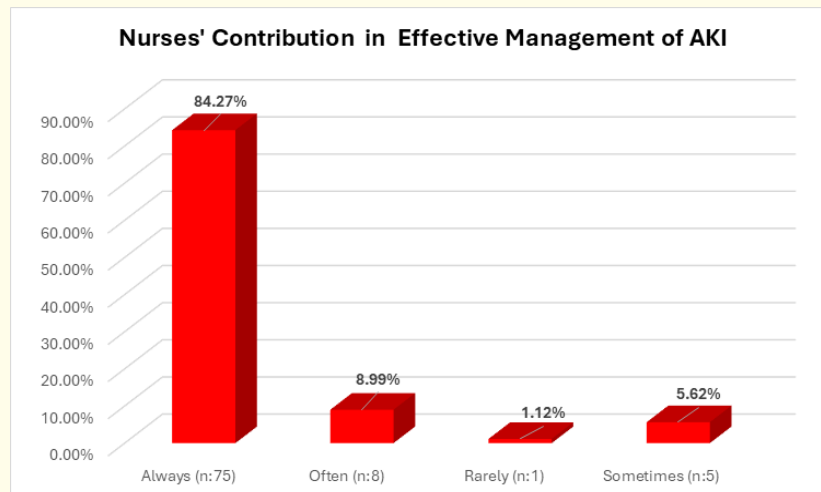


Figure 1: Nurses' Contribution to the Effective Management of Acute Kidney Injury.

Source: Primary data, 2024

involvement is crucial for ensuring the best possible patient outcomes. The relatively low percentages for 'Often', 'Sometimes', and 'Rarely' categories indicate that while some nurses contribute less frequently, the overall commitment to AKI management is strong. This summary highlights the dedication of the nursing staff towards managing AKI effectively, reflecting a positive trend in clinical practice and teamwork within the hospital.

Nurses 'Knowledge in Effective Management of Acute Kidney Injury.

The study reveals that 55.06% of respondents at Gihundwe District Hospital have excellent knowledge about Acute Kidney Injury (AKI), with 43.82% being good. All respondents are aware of common symptoms of AKI, and 84.27% are familiar with AKI man-

Variables	Description	Frequencies	Percentage (%)
Rating of knowledge on the causes of AKI	Excellent	49	55.06
	Fair	1	1.12
	Good	39	43.82
Awareness of common symptoms of AKI	Yes	89	100
Familiarity with AKI management guidelines	Somewhat familiar	14	15.73
	Very familiar	75	84.27
Knowledge of common treatments for AKI	Dialysis	7	7.87
	Fluid management	9	10.11
	Fluid management, Dialysis, Nutritional	2	2.25
	Fluid management, Medication adjustment	2	2.25
	Fluid management, Medication adjustment	1	1.12
	Fluid management, Medication adjustment	47	52.81
	Fluid management, Medication adjustment	8	8.99
	Fluid management, Medication adjustment	11	12.36
	Medication adjustments	1	1.12
	Medication adjustments, Dialysis	1	1.12
Knowledge of preventive measures for AKI	Never	6	6.74
	Occasionally (once in 2-3 years)	10	11.24
	Rarely	8	8.99
	Regularly (at least once a year)	65	73.03

Table 2: Distribution of Nurses' Knowledge in the effective Management of Acute Kidney Injury at Gihundwe District Hospital.

Source: Primary data, 2024.

agement guidelines. Common treatments for AKI include dialysis and fluid management, with various combinations reported. Preventive measures for AKI are rarely used, with 6.74% never using them, 11.24% occasionally, 8.99% rarely, and 73.03% regularly. These findings offer insights into the knowledge and practices among nurses at Gihundwe District Hospital.

The figure 2 "Knowledge of the Causes of Acute Kidney Injury (AKI)" compares knowledge levels among nursing professionals with a Bachelor's Degree in Nursing and a Diploma in Nursing. The categories are "Excellent," "Fair," and "Good." The chart shows that individuals with a Bachelor's Degree tend to have higher knowledge of AKI causes. The chart also shows that there are no individuals with a Bachelor's Degree who have a Diploma, and 19 individuals with a Diploma who have a Bachelor's Degree.

Variables	Description	Frequencies	Percentage (%)
Rating of knowledge on the causes of AKI	Excellent	49	55.06
	Fair	1	1.12
	Good	39	43.82
Awareness of common symptoms of AKI	Yes	89	100
Familiarity with AKI management guidelines	Somewhat familiar	14	15.73
	Very familiar	75	84.27
Knowledge of common treatments for AKI	Dialysis	7	7.87
	Fluid management	9	10.11
	Fluid management, Dialysis, Nutritional	2	2.25
	Fluid management, Medication adjustment	2	2.25
	Fluid management, Medication adjustment	1	1.12
	Fluid management, Medication adjustment	47	52.81
	Fluid management, Medication adjustment	8	8.99
	Fluid management, Medication adjustment	11	12.36
	Medication adjustments	1	1.12
	Medication adjustments, Dialysis	1	1.12
Knowledge of preventive measures for AKI	Never	6	6.74
	Occasionally (once in 2-3 years)	10	11.24
	Rarely	8	8.99
	Regularly (at least once a year)	65	73.03

Table 2: Distribution of Nurses' Knowledge in the effective Management of Acute Kidney Injury at Gihundwe District Hospital.

Source: Primary data, 2024.

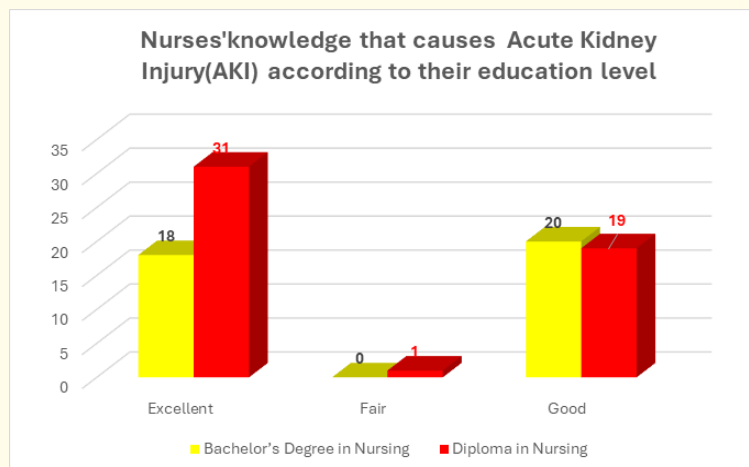


Figure 2: Nurses' knowledge that causes Acute Kidney Injury (AKI) basing on education level.

Source: Primary data, 2024.

Variables	Descriptions	Contribution of nurse on Effective Management of AKI (n:89)			P-Value
		Excellent	Fair	Good	
Age	20-30 year	31	1	19	0.576
	31-40 year	15	0	14	
	41-50 year	3	0	4	
	51-60 year	0	0	2	
Gender	Female	22	1	24	0.19
	Male	27	0	15	
Educational Level	Bachelor in nursing	18	0	20	0.268
	Diploma in Nursing	31	1	19	
Experience	0-5 years	37	1	24	0.558
	11-15 years	2	0	4	
	16-20 years	0	0	2	
	6-10 years	10	0	9	
Department/Unit	Emergency	27	1	16	0.485
	Intensive Care Unit	1	0	1	
	Medical Ward	4	0	5	
	Other	0	0	4	
	Surgical Ward	17	0	13	

Table 3: Demographic and Professional Characteristics of Nurses and Their Contribution to Effective Management of Acute Kidney Injury (AKI).

Source: Primary data, 2024.

This table 3 about “Demographic and Professional Characteristics of Nurses and Their Contribution to Effective Management of Acute Kidney Injury (AKI)” presents data on nurses’ contributions to managing AKI. The majority of nurses in the 20-30 age group received an “Excellent” rating, while no nurses in the 51-60 age group received any rating. Female nurses had higher contributions than male nurses, but the difference was not statistically significant. Nurses with a Bachelor’s degree or a Diploma had similar contributions. Experience varies across departments, with emergency and surgical ward nurses contributing significantly.

Attitude of Nurses on Effective Management of Acute Kidney Injury (AKI) at Gihundwe district Hospital.

The data from a table 4 on Acute Kidney Injury (AKI) management reveals that 7 respondents (7.87%) considered evidence-based guidelines important, while 82 respondents (92.13%) considered them very important. The importance of nurses in AKI

management was also emphasized, with 10 respondents (11.24%) agreeing and 78 respondents (87.64%) strongly agreeing. Confidence in managing AKI patients was also high, with 10 respondents (11.24%) and 78 respondents (87.64%) confident. However, 79 respondents (88.76%) agreed that more training and education on AKI is needed, and 79 respondents (88.76%) were motivated to learn and implement new practices. This data provides valuable insights into healthcare professionals’ perceptions of AKI management, emphasizing the importance of evidence-based guidelines and the crucial role of nurses.

Nurses’ Practices in Effective Management of Acute Kidney Injury Patients at Gihundwe district hospital.

This table 5 shows that a majority of the nurses (89.89%) consistently assess kidney function in at-risk patients, demonstrating a high level of vigilance in monitoring for AKI. The most common method used to monitor kidney function involves a combination of blood tests, urine output measurement, and imaging studies

Variables	Description	Frequencies	Percentage (%)
Importance of Evidence-Based Guidelines for AKI Management	Important	7	7.87
	Very important	82	92.13
Belief in the crucial role of nurses in AKI management.	Agree	10	11.24
	Neutral	1	1.12
	Strongly agree	78	87.64
Confidence in managing AKI patients	Confident	10	11.24
	Neutral	1	1.12
	Very confident	78	87.64
Need for more training and education on AKI	Agree	10	11.24
	Strongly agree	79	88.76
Motivation to learn and implement new practices	Motivated	10	11.24
	Very motivated	79	88.76

Table 4: Attitude of Nurses on Effective Management of Acute Kidney Injury (AKI).

Source: Primary data, 2024.

Variables	Description	Frequencies	Percentage (%)
Frequency of assessing kidney function in at-risk patients	Always	80	89.89
	Often	8	8.99
	Sometimes	1	1.12
Common methods used to monitor kidney function	Blood tests (e.g., creatinine, BUN)	5	5.62
	Blood tests (e.g., creatinine, BUN), Imaging studies (e.g., ultrasound)	1	1.12
	Blood tests (e.g., creatinine, BUN), Urine output measurement	12	13.48
	Blood tests (e.g., creatinine, BUN), Urine output measurement, Imaging studies (e.g., ultrasound)	56	62.92
	Urine output measurement	7	7.87
	Urine output measurement, Imaging studies (e.g., ultrasound)	2	2.25
	Urine output measurement, Imaging studies (e.g., ultrasound), Other (please specify):	5	5.62
	Urine output measurement, Other		
Implementation of preventive measures	Always	81	91.01
	Often	7	7.87
	Sometimes	1	1.12
Challenges faced in effective management	Heavy workload	6	6.74
	Heavy workload, Limited access to guidelines	4	4.49
	Insufficient training	23	25.84
	Insufficient training, Heavy workload	10	11.24
	Insufficient training, Limited access to	3	3.37
	Lack of resources	8	8.99
	Lack of resources, Heavy workload	4	4.49
	Lack of resources, Insufficient training	12	13.48
	Lack of resources, Insufficient training, Heavy workload	6	6.74
	Lack of resources, Insufficient training, Heavy workload, Limited access to guidelines	1	1.12
	Lack of resources, Insufficient training, Heavy workload, Limited access to guidelines, Other	5	5.62
	Lack of resources, Insufficient training, Limited access to guidelines	4	4.49
	Lack of resources, Insufficient training, Heavy workload, Limited access to guidelines	1	1.12
	Limited access to guidelines	2	2.25

(62.92%), indicating a comprehensive approach in diagnosing and managing AKI. Preventive measures are consistently implemented by a vast majority of the nurses (91.01%), highlighting their commitment to proactive AKI management. The most prevalent challenge is insufficient training (25.84%), followed by a combination of lack of resources and insufficient training (13.48%). These find-

ings suggest a need for enhanced training programs and resource allocation to address the barriers in effective AKI management.

Association between nurses' knowledge and attitudes in Effective Management of Acute Kidney Injury (AKI) at Gihundwe district Hospital.

Variables	Descriptions	Attitudes of nurse on Effective Management of AKI (n:89)			P-Value
		Excellent	Fair	Good	
Importance of Evidence-Based Guidelines for AKI Management	Important	3 (42.86%)	0 (0%)	7 (57.14%)	0.741
	Very important	46.9 (56.1%)	1 (1.22%)	35 (42.68%)	
Belief in the crucial role of nurses in AKI management	Agree	6 (60%)	0 (0%)	4 (40%)	0.9
	Neutral	1 (100%)	0 (0%)	0 (0%)	
	Strongly agree	42 (53.85%)	1 (1.28%)	35 (43.82%)	
Confidence in managing AKI patients	Confident	6 (60%)	0 (0%)	4 (40%)	0.617
	Neutral	0 (0%)	0 (0%)	1 (100%)	
	Very confident	45 (57.69%)	1 (1.28%)	32 (41.03%)	
Need for more training and education on AKI	Agree	2 (20%)	0 (0%)	8 (80%)	0.05
	Strongly agree	47 (59.49%)	1 (1.27%)	31 (39.24%)	
Motivation to learn and implement new practices	Motivated	2 (20%)	0 (0%)	8 (80%)	0.05
	Very motivated	47 (59.49%)	1 (1.27%)	31 (39.24%)	

Table 6: Association between nurses' knowledge and attitudes in Effective Management of Acute Kidney Injury (AKI) at Gihundwe district Hospital.

Source: Primary data, 2024.

The table 6 indicate that there is a significant association between the need for more training and education on AKI (p:0.05), and as well as the motivation to learn and implement new practices (p:0.05). However, there is no significant association between the importance of evidence-based guidelines, belief in the crucial role of nurses, and confidence in managing AKI patients with nurses' attitudes. This suggests that while training and motivation are crucial, other factors like guidelines and confidence might not directly influence attitudes but are still important for effective management.

Association between nurses' knowledge and practices on Effective Management of Acute Kidney Injury (AKI) at Gihundwe district Hospital.

The table 7 presents findings on nurses 'practices regarding to the effective management of AKI, with significant p-values indicat-

ing notable associations. Here are the main associations: Regular assessment of kidney function (always) is significantly associated with higher-quality nursing practices in managing AKI (p-value: 0.008). The use of comprehensive monitoring methods, including blood tests, urine output measurement, and imaging studies, is significantly associated with better nursing practices in AKI management (p-value: 0.018). Consistent implementation of preventive measures is highly significantly associated with superior nursing practices in AKI management (p-value: <0.01). Effective collaboration with other healthcare professionals is significantly associated with higher-quality nursing practices in managing AKI (p-value: 0.003). The findings indicate that regular and comprehensive assessment methods, consistent preventive measures, and effective collaboration among healthcare professionals significantly contribute to the quality of nursing practices in managing Acute Kidney Injury. These factors should be emphasized in training and practice to enhance the management of AKI by nurses.

Variables	Descriptions	Nurses' Practices in Effective Management of AKI (n:89)			P-Value
		Excellent	Fair	Good	
Frequency of assessing kidney function in at-risk patients	Always	47 (58.75%)	0 (0%)	33 (41.245%)	0.008
	Often	2 (25%)	1 (12.5%)	5 (62.5%)	
	Sometimes	0 (0%)	0 (0%)	1 (100%)	
Common methods used to monitor kidney function	Blood tests (e.g., creatinine, BUN)	4 (80%)	0 (0%)	1 (20%)	0.018
	Blood tests (e.g., creatinine, BUN), Imaging studies (e.g., ultrasound)	1 (100%)	0 (0%)	0 (0%)	
	Blood tests (e.g., creatinine, BUN), Urine output measurement	4 (33.33%)	0 (0%)	8 (66.67%)	
	Blood tests (e.g., creatinine, BUN), Urine output measurement, Imaging studies (e.g., ultrasound)	33 (58.93%)	0 (0%)	23 (41.07%)	
	Urine output measurement	2 (28.57%)	0 (0%)	5 (71.43%)	
	Urine output measurement, Imaging studies (e.g., ultrasound)	2 (100%)	0 (0%)	0 (0%)	
	Urine output measurement, Imaging studies (e.g., ultrasound), Other (please specify):	3 (60%)	1 (20%)	1 (20%)	
Implementation of preventive measures	Always	45 (55.56%)	0 (0%)	36 (44.44%)	<0.01
	Often	4 (57.14%)	0 (0%)	3 (42.86%)	
	Sometimes	0 (0%)	1 (100%)	0 (0%)	
Challenges faced in effective management	Heavy workload	3 (50%)	0 (0%)	3 (50%)	0.648
	Heavy workload, Limited access to guidelines	3 (75%)	0 (0%)	1 (25%)	
	Insufficient training	10 (43.48 %)	0 (0%)	13 (56.52 %)	
	Insufficient training, Heavy workload	5 (50 %)	0 (0%)	5 (50 %)	
	Insufficient training, Limited access t	2 (66.67 %)	0 (0%)	1 (33.33 %)	
	Lack of resources	5 (62.5 %)	0 (0%)	3 (37.5 %)	
	Lack of resources, Heavy workload	1 (25 %)	0 (0%)	3 (75 %)	
	Lack of resources, Insufficient training	1 (100 %)	0 (0%)	0 (0%)	
	Lack of resources, Insufficient training, Heavy workload	7 (63.64 %)	0 (0%)	4 (36.36 %)	
	Lack of resources, Insufficient training, Heavy workload, Limited access to guidelines	4 (66.67 %)	0 (0%)	2 (33.33 %)	
	Lack of resources, Insufficient training, Heavy workload, Limited access to guidelines, Other	1 (100 %)	0 (0%)	0 (0%)	
	Lack of resources, Insufficient training, Limited access to guidelines	3 (60 %)	1 (20 %)	1 (20 %)	
	Lack of resources, Insufficient training, Heavy workload, Limited access to guidelines	2 (50 %)	0 (0%)	2 (50 %)	
Limited access to guidelines	1 (50 %)	0 (0%)	1 (50 %)		
Nurses collaborate with other healthcare professionals	Always	43 (57.33%)	0 (0%)	32 (42.67%)	0.003
	Often	3 (37.5%)	0 (0%)	5 (62.5%)	
	Rarely	0 (0%)	0 (0%)	1 (100%)	
	Sometimes	3 (60%)	1 (20%)	1 (20%)	

Table 7: Association between nurses' knowledge and practices on Effective Management of Acute Kidney Injury (AKI) at Gihundwe district Hospital.
Source: Primary data, 2024.

Discussion of Findings

The findings of this study provide a comprehensive overview of the contributions, knowledge, attitudes, and practices of nurses in the effective management of Acute Kidney Injury (AKI) at Gihundwe District Hospital. This discussion integrates the key findings with recent literature to contextualize the results and highlight their implications for clinical practice and future research.

The study sample predominantly consisted of young nurses aged between 20-30 years (57.3%), with females slightly outnumbering males. Most respondents held a Diploma in nursing (57.3%) and had between 0-5 years of nursing experience (69.66%). The Emergency Department had the highest number of respondents (49.44%). These demographics suggest a relatively inexperienced but potentially adaptable workforce, primarily engaged in front-line emergency care.

A significant majority of nurses (84.27%) reported consistently contributing to the effective management of AKI. This high level of involvement is critical for patient outcomes and reflects a strong commitment to clinical practice. The data indicates that while a minority of nurses contribute less frequently, the overall dedication to managing AKI is robust.

The knowledge assessment revealed that 55.06% of nurses had excellent knowledge regarding the causes of AKI, while 43.82% rated their knowledge as good. All nurses were aware of common AKI symptoms, and 84.27% were familiar with AKI management guidelines. Common treatments recognized included fluid management, medication adjustments, and dialysis, with a significant emphasis on regular implementation of preventive measures (73.03%). The high level of knowledge among nurses is encouraging, as it underpins their ability to provide effective care.

The attitudes of nurses towards AKI management were overwhelmingly positive. A majority (92.13%) considered evidence-based guidelines very important, and 87.64% strongly believed in the crucial role of nurses in managing AKI. Confidence levels were similarly high, with 87.64% of nurses expressing strong confidence in their ability to manage AKI patients. Additionally, 88.76% of nurses strongly agreed on the need for more training and education, indicating a proactive attitude towards professional development and patient care improvement.

The nurses' practices were largely aligned with their knowledge and attitudes. Most nurses (89.89%) always assessed kidney function in at-risk patients, employing a comprehensive approach that included blood tests, urine output measurement, and imaging studies (62.92%). Preventive measures were consistently implemented by 91.01% of nurses, demonstrating a proactive stance in managing AKI. However, challenges such as insufficient training (25.84%) and lack of resources (13.48%) were noted, suggesting areas for improvement in training programs and resource allocation.

Significant associations were observed between nurses' knowledge and their practices. For instance, regular assessment of kidney function was significantly associated with better nursing practices (p-value: 0.008). Comprehensive monitoring methods and consistent implementation of preventive measures were also linked to superior practices (p-values: 0.018 and <0.01, respectively). Moreover, effective collaboration with other healthcare professionals was significantly associated with higher-quality nursing practices (p-value: 0.003). These findings underscore the importance of continuous education, comprehensive assessment methods, and interdisciplinary collaboration in enhancing the management of AKI.

Recent Findings in Literature

Recent studies corroborate the findings of this research, emphasizing the critical role of nurse education and interdisciplinary teamwork in managing AKI. A study done by Fateme N.H., *et al.* (2023) highlighted that continuous professional development and adherence to evidence-based guidelines significantly improve AKI outcomes [13]. Similarly, Ivica, *et al.* (2022) found that comprehensive assessment tools and proactive preventive measures are essential in reducing the incidence and severity of AKI in hospital settings [14]. Therefore, the study highlights the significant nurses' contributions, strong knowledge base, positive attitudes, and practices in effectively managing AKI at Gihundwe District Hospital. However, it also identifies critical areas for improvement, such as the need for enhanced training and resource allocation. By addressing these challenges, healthcare institutions can further empower nurses and improve patient outcomes in AKI management. The findings align with recent literature, reinforcing the importance of continuous education, evidence-based practices, and collaborative care in the effective management of AKI.

The study by Brooks Carthon JM., *et al.* (2020) [15] investigates the relationship between nurse engagement, staffing levels, and patient safety in hospitals. Key findings show that 32% of nurses rated their hospital's patient safety poorly, while in 25% of hospitals, nurse engagement was low ("least" or "somewhat" engaged). Notably, a one-unit increase in nurse engagement significantly reduced the likelihood of poor patient safety ratings by 29% ($p < .001$). Additionally, in hospitals with higher nurse engagement, there was a 19% lower chance of punitive responses to mistakes ($p < .001$), suggesting a supportive environment. Conversely, in poorly staffed hospitals, nurses were 6% more likely to report critical patient information lapses during unit transfers ($p < .001$). These findings highlight the importance of both adequate staffing and high nurse engagement in promoting patient safety.

The study by Dushimiyimana., *et al.* (2022) [5] highlights significant gaps in nurses' knowledge regarding the early detection and management of acute kidney injury (AKI) in selected Rwandan referral hospitals. The findings suggest that nurses generally have limited knowledge of AKI, a critical gap given that AKI is a common and life-threatening condition that can extend hospital stays, increase resource use, and elevate mortality risks. However, the study found that in-service training significantly enhances nurses' understanding of early AKI detection ($p = 0.049$) and management ($p = 0.008$), as does prior AKI education in nursing school ($p = 0.035$). These associations underscore the value of targeted training programs to build nurses' competencies in AKI care. The authors conclude that because nurses are often the first to observe changes in patient conditions, enhancing their role in AKI detection and management is vital for improving patient outcomes and reducing associated risks.

Conclusion

This study highlights the critical role of nurses in the effective management of Acute Kidney Injury (AKI) at Gihundwe District Hospital. The findings reveal a high level of knowledge, positive attitudes, and strong practices among the nursing staff, which are essential for improving patient outcomes. However, challenges such as insufficient training and resource limitations suggest areas for further development. Continuous education, comprehensive assessment methods, and interdisciplinary collaboration are key to enhancing the quality of AKI care. These insights provide valuable

direction for future research and clinical practice improvements. Key factors associated with effective management of kidney injuries include the practice of frequent assessment of kidney function in at-risk patients, use of common methods in monitoring kidney functions, implementation of preventive measures, and collaboration between healthcare professionals.

Acknowledgements

We would like to extend my deepest gratitude to everyone who has supported and contributed to the completion of this research study.

First and foremost, we are profoundly grateful to the nurses at Gihundwe District Hospital. Your cooperation, insights, and willingness to share your experiences have been invaluable to this research. Your dedication to patient care and professional excellence is truly inspiring.

We would also like to express my sincere thanks to the management and staff of Gihundwe District Hospital for granting us the opportunity to conduct this study and for providing the necessary resources and support.

A special thank you to peers for your insights, feedback, and camaraderie. Your support has enriched this research experience.

Lastly, we are grateful to all the patients whose experiences and resilience inspire continuous improvement in healthcare. This study is dedicated to advancing the quality of care you receive.

Funding

The study did not receive specific funding.

Data Availability

Data used in this study are available from corresponding author upon requested on reasonable request

Conflict of Interest

All authors declared that there are no competing interests.

Appendices

Appendix 1: Questionnaire

Consent Statement

I have read the information above, and I understand the purpose and procedures of this study. I consent to participate in this research study.

Thank you for your participation.

Participant Name (code): _____

Signature: _____

Date: _____

Researcher Name: _____

Signature: _____

Date: _____

Questionnaire for Nurses on Effective Management of Acute Kidney Injury at Gihundwe District Hospital

Instructions: Please answer the following questions honestly and to the best of your knowledge. The responses were remaining confidential and was only be used for the purpose of this research study.

Section A: Demographic Information

1. Age:

- a) 20-30
- b) 31-40
- c) 41-50
- d) 51-60
- e) Above 60

2. Gender:

- a) Male
- b) Female
- c) Other

3. Educational Level:

- a) Diploma in Nursing
- b) Bachelor's Degree in Nursing
- c) Master's Degree in Nursing
- d) Other (please specify): _____

4. Years of Experience as a Nurse:

- a) 0-5 years
- b) 6-10 years
- c) 11-15 years
- d) 16-20 years
- e) More than 20 years

5. Department/Unit:

- a) Emergency
- b) Intensive Care Unit (ICU)
- c) Medical Ward
- d) Surgical Ward
- e) Other (please specify): _____

Section B: Knowledge of Nurses on Effective Management of Acute Kidney Injury (AKI)

6. How would you rate your knowledge of the causes of Acute Kidney Injury (AKI)?

- a) Excellent
- b) Good
- c) Fair
- d) Poor

7. Do you know the common symptoms of AKI?

- a) Yes
- b) No

8. How familiar are you with the guidelines for the management of AKI?

- a) Very familiar
- b) Somewhat familiar
- c) Not familiar

9. Which of the following are common treatments for AKI? (Select all that apply)

- a) Fluid management
- b) Medication adjustments
- c) Dialysis
- d) Nutritional support
- e) Other (please specify): _____

10. How often do you attend training sessions or workshops on AKI management?

- a) Regularly (at least once a year)
- b) Occasionally (once in 2-3 years)
- c) Rarely
- d) Never

Section C: Attitude of Nurses on Effective Management of Acute Kidney Injury (AKI)

11. How important do you think it is to follow evidence-based guidelines for AKI management?

- a) Very important
- b) Important
- c) Somewhat important
- d) Not important

12. Do you believe that nurses play a crucial role in the management of AKI?

- a) Strongly agree
- b) Agree
- c) Neutral
- d) Disagree
- e) Strongly disagree

13. How confident are you in your ability to manage patients with AKI?

- a) Very confident
- b) Confident
- c) Neutral
- d) Not confident

14. Do you think more training and education on AKI management are needed for nurses?

- a) Strongly agree
- b) Agree
- c) Neutral
- d) Disagree
- e) Strongly disagree

15. How motivated are you to learn about and implement new practices in AKI management?

- a) Very motivated
- b) Motivated
- c) Neutral
- d) Not motivated

Section D: Practices of Nurses on Effective Management of Acute Kidney Injury (AKI) Patients

16. How frequently do you assess kidney function in patients at risk of AKI?

- a) Always
- b) Often
- c) Sometimes
- d) Rarely
- e) Never

17. Which methods do you commonly used to monitor kidney function in patients? (Select all that apply)

- a) Blood tests (e.g., creatinine, BUN)
- b) Urine output measurement
- c) Imaging studies (e.g., ultrasound)
- d) Other (please specify): _____

18. How often do you implement preventive measures to avoid AKI in at-risk patients?

- a) Always
- b) Often
- c) Sometimes
- d) Rarely
- e) Never

19. What challenges do you face in the effective management of AKI? (Select all that apply)

- a) Lack of resources
- b) Insufficient training
- c) Heavy workload
- d) Limited access to guidelines
- e) Other (please specify): _____

20. How often do you collaborate with other healthcare professionals (e.g., doctors, dietitians) in the management of AKI?

- a) Always
- b) Often
- c) Sometimes
- d) Rarely
- e) Never

Section E: Additional Comments

21. Please provide any additional comments or suggestions on how the management of AKI can be improved at Gihundwe District Hospital. Thank you for your participation! Your responses are valuable for the improvement of AKI management at Gihundwe District Hospital.

Appendix 2: Introduction letter of Authorization.



TO WHOM IT MAY CONCERN,

We write this letter to humbly request you to allow:

- 1. Mr/Ms. NDABARORA Eleazar.....Dean.....Reg Num...2000073
- 2. Mr/Ms. MUHAMMADIYAMAHA.....Student..... Reg Num 2000079

To conduct research in your Organization/Institution/Territorial entity

The above mentioned are students at Kibogora Polytechnic pursuing Bachelor's degree in

- 1. General Nursing

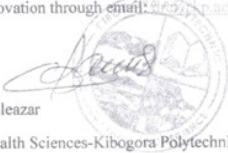
The candidate are conducting research entitled:

Assessment of Contribution, Knowledge, Attitude and Practices of Nurses in Effective Management of Acute Kidney Injury at Gihundwe District Hospital

We are convinced that your Organization/Institution/Territorial entity will constitute a valuable source of information pertaining to their research. The purpose of this letter is to humbly requesting you to avail them with the pertinent information they may need. We pledge to ensure that all provided information will be used in the strict academic purpose.

For any inquiries, please contact Dr. Gabriel Janvier TUGIRINSHUTI, Director of Research, Consultancy, and Innovation through email: gtugir@kibogora.ac.rw or Tel: 0788793509

Yours sincerely,



Dr. NDABARORA Eleazar
 Dean of faculty of Health Sciences-Kibogora Polytechnic
 Email: eleazarndaba@gmail.com
 Tel: 0785371340

Appendix 3: Letter Request for Permission to Access Nurse.



Prex Joel NDUWAYEZU
Solange MUSHIMIYIMANA
KIBOGORA- NYAMASHEKE
nduwayezu.joeprex@gmail.com
kimsoso605@gmail.com
0788690481
0783777248
03 July 2024

To the General Director of
Gihundwe District Hospital
Kamembe-Rusizi

RE: Request for Permission to Access Nurses for Research Study on Acute Kidney Injury Management

Dear Dr Edith MUKAYIRANGA,

We hope this letter finds you in good health and high spirits. Our name is Prex Joel NDUWAYEZU, Solange MUSHIMIYIMANA, and we are an undergraduate student at Kibogora Polytechnic University. We are writing to seek your permission to access the nursing staff at Gihundwe District Hospital for the purpose of conducting a research study titled "Assessment of Contribution, Knowledge, Attitude, and Practices of Nurses on Effective Management of Acute Kidney Injury at Gihundwe District Hospital."

The aim of this study is to evaluate the current knowledge, attitudes, and practices of nurses regarding the management of acute kidney injury (AKI). Given the critical role that nurse's play in patient care, understanding these factors is essential for developing strategies to improve patient outcomes and enhance the overall quality of healthcare services.

The objectives of this study are to:

1. Assess the level of knowledge among nurses regarding AKI management.
2. Evaluate the attitudes of nurses towards the management of AKI.
3. Identify current practices employed by nurses in the management of AKI.
4. Determine the contribution of nursing practices to the effective management of AKI.

REPUBLIC OF RWANDA



WESTERN PROVINCE
RUSIZI DISTRICT
GIHUNDWE HOSPITAL
E-mail: gihundwe.hospital@moh.gov.rw

Gihundwe, on 08th June 2024

Ref: 20²⁴/HGDISTRUSIZI/24

To: Mr/ Mrs MUSHIMIYIMANA Solange

And NDUWAYEZU Joel

Tel: 0788690481

0783777248

Nduwayezu.joeprex@gmail.com

Kimsosos605@gmail.com

Students at KIBOGORA Polytechnic

Re: Authorizations for Permission to Access Nurses for Research Study on Acute Kidney Injury Management.

Dear Solange and Joel,

I'm hereby responding to your letter requesting a Permission to Access Nurses for Research Study on Acute Kidney Injury Management

In fact, we recognize your request as favorable but it will not be payable. Your research will start since the 08 July 2024 up to 10 July 2024 So, you are requested to report to the director of nursing after research.

Sincerely yours,

Dr MUKAYIRANGA Edithe

Director General of Gihundwe Hospital



CC:

-Director of NURSING

PO Box 87 Rusizi | phone: +250784277983 | Email: gihundwe.hospital@moh.gov.rw | Instagram: [@gihundwehospital](https://www.instagram.com/gihundwehospital) | Facebook: [@gihundwehospital](https://www.facebook.com/gihundwehospital) X: [@GihundweH](https://www.x.com/gihundweh)

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