1.1 Background of the Study

Acute kidney injury (AKI) is a sudden decline in kidney function that can develop over hours or days. It may result from reduced blood flow to the kidneys, direct kidney damage, or obstruction of urine flow. AKI can lead to serious complications, including fluid and electrolyte imbalances. Early recognition and appropriate management are essential to reduce complications and improve patient outcomes (KDIGO Acute Kidney Injury Work Group, 2012).

Nurses play an important role in the early recognition and prevention of AKI through patient assessment, monitoring of urine output, observation of clinical changes, and timely reporting of abnormal findings. Therefore, assessing nurses' knowledge of AKI is important for identifying educational needs and supporting the quality of nursing care.

1.2 Problem Statement

Acute kidney injury is a significant clinical problem that requires early recognition and appropriate nursing care. Gaps in nurses' knowledge may affect the timely identification of risk factors, clinical manifestations, and complications. However, the level of nurses' knowledge regarding AKI at Dongola Specialized Hospital has not been established. Therefore, this study seeks to answer the following question:

What is the level of nurses' knowledge regarding acute kidney injury at Dongola Specialized Hospital, Northern State, Sudan?

1.3 Justification of the Study

This study is important because nurses are directly involved in monitoring patients and identifying early signs of clinical deterioration. Assessing their knowledge may reveal areas requiring further education and training. The findings may help inform educational activities and support improvements in nursing practice related to AKI.

1.4 General Objective

To assess nurses' knowledge regarding acute kidney injury among adult patients at Dongola Specialized Hospital, Northern State, Sudan.

1.5 Specific Objectives

1. To assess nurses' knowledge of the definition of AKI.
2. To assess nurses' knowledge of the causes and risk factors of AKI.
3. To assess nurses' knowledge of the classification and stages of AKI.
4. To assess nurses' knowledge of the signs and symptoms of AKI.
5. To assess nurses' knowledge of the complications of AKI.
6. To assess nurses' knowledge of the early recognition of AKI.
7. To assess nurses' knowledge of nursing assessment and monitoring in AKI.
8. To assess nurses' knowledge of nursing diagnoses related to AKI.
9. To assess nurses' knowledge of the nursing care and prevention of AKI.

1.6 Research Questions

1. What do nurses know about the definition of AKI?
2. What do nurses know about the causes and risk factors of AKI?
3. What do nurses know about the classification and stages of AKI?
4. What do nurses know about the signs and symptoms of AKI?
5. What do nurses know about the complications of AKI?
6. What do nurses know about the early recognition of AKI?
7. What do nurses know about nursing assessment and monitoring in AKI?
8. What do nurses know about nursing diagnoses related to AKI?

9. What do nurses know about the nursing care and prevention of AKI?2.1 Definition of Acute Kidney Injury

Acute kidney injury is a sudden reduction in kidney function identified by changes in serum creatinine and/or urine output. The KDIGO guideline provides standardized criteria for its diagnosis and classification (KDIGO Acute Kidney Injury Work Group, 2012).

2.2 Causes and Risk Factors

AKI may occur due to reduced blood flow to the kidneys, direct damage to kidney tissue, or obstruction of urine flow. Risk factors include dehydration, sepsis, major blood loss, pre-existing kidney disease, diabetes, heart failure, and exposure to medicines that may harm kidney function (National Institute for Health and Care Excellence [NICE], 2024).

2.3 Classification and Stages

According to KDIGO, AKI is classified into three stages based on the severity of changes in serum creatinine and urine output. Staging helps healthcare professionals assess severity and monitor disease progression.

2.4 Signs and Symptoms

Clinical manifestations may include reduced urine output, swelling, fatigue, nausea, and changes in fluid balance. Some patients may have few obvious symptoms; therefore, clinical assessment and laboratory monitoring are important.

2.5 Complications

Possible complications include electrolyte disturbances, metabolic acidosis, fluid overload, and accumulation of waste products in the blood. Severe cases may require kidney replacement therapy.

2.6 Early Recognition and Prevention

Early recognition involves identifying risk factors, monitoring urine output, assessing fluid status, reviewing relevant laboratory results, and reporting deterioration promptly. Prevention includes appropriate fluid management, monitoring patients at risk, and avoiding or reviewing potentially harmful medicines when clinically indicated (NICE, 2024).

2.7 Nursing Assessment and Care

Nursing care includes monitoring vital signs, fluid intake and output, urine output, laboratory findings, and clinical changes. Nurses should promptly report abnormal findings, follow prescribed treatment plans, document observations accurately, and provide appropriate patient education.

2.8 Nurses' Knowledge of AKI

Nurses' knowledge is important for identifying patients at risk and recognizing possible AKI early. A 2026 study by Mlay and colleagues assessed nurses' knowledge of AKI at a tertiary hospital in Dar es Salaam, Tanzania. Such research provides relevant context for evaluating nurses' knowledge in other hospital settings (Mlay et al., 2026).

2.9 Summary of the Literature Review

The literature highlights the importance of early recognition, monitoring, prevention, and appropriate nursing care in AKI. Assessing nurses' knowledge at Dongola Specialized Hospital may help identify local educational needs and areas for improvement.3.1 Study Design

A descriptive cross-sectional study will be conducted to assess nurses' knowledge regarding AKI.

3.2 Study Setting

The study will be conducted at Dongola Specialized Hospital, Northern State, Sudan.

3.3 Study Population

The study population consists of 223 nurses working at Dongola Specialized Hospital who meet the eligibility criteria.

3.4 Sample Size

The sample size is 142 nurses, calculated from a population of 223 nurses using a 95% confidence level, a 5% margin of error, an assumed population proportion of 50%, and finite population correction.

3.5 Sampling Technique

Ninety-four eligible nurses will be selected from the total population of 223. The specific selection method, such as simple random sampling, must be confirmed and applied consistently.

3.6 Data Collection Tool

Data will be collected using a structured, self-administered questionnaire in Arabic. The questionnaire contains 40 questions: seven demographic and professional questions and 33 knowledge questions concerning AKI.

3.7 Data Collection Period

The overall study period is planned for six months. The stated data collection period is from 20 September to 20 November 2026. These dates and the sequence of ethics approval, recruitment, and data collection must be consistent with the approved research plan.

3.8 Data Analysis

Data will be coded and analyzed using appropriate descriptive statistics, including frequencies and percentages. Each correct answer to the 33 knowledge questions will receive one point, while an incorrect or unanswered item will receive zero points. Each participant's knowledge percentage will be calculated as:

$$\text{Knowledge percentage} = (\text{Number of correct answers} \div 33) \times 100.$$

Any categories used to classify knowledge levels must be defined before analysis and justified in the research protocol.

3.9 Validity and Reliability

The questionnaire should be reviewed by qualified experts to assess content validity. A pilot test should be conducted where appropriate, and the reliability of the knowledge instrument should be assessed using a suitable method.

3.10 Ethical Considerations

Ethical approval must be obtained from the relevant ethics committee, and administrative permission must be secured from the hospital before recruitment and data collection. Written informed consent will be obtained from participants. Participation will be voluntary, and refusal or withdrawal will not result in penalties. Confidentiality will be maintained, personal identifiers will be avoided where possible, and data will be stored securely with access restricted to authorized researchers.

3.11 Risks and Benefits

The study is expected to involve minimal risk. Participants may experience minor inconvenience or discomfort when answering questions. No direct clinical benefit is guaranteed, but the findings may identify knowledge gaps and inform future educational activities.

3.12 Dissemination of Findings

The results will be presented in the academic research report and may be shared with relevant academic and hospital authorities. Findings will be reported in aggregate form to protect participants' confidentiality

References

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3. National Institute for Health and Care Excellence. (2024). Acute kidney injury: Prevention, detection and management (NICE guideline NG148). https://www.nice.org.uk/guidance/ng148