

MANAGEMENT OF ULTRASOUND BY NURSES IN THE EVALUATION OF URINARY RESIDUE: A SCOPING REVIEW PROTOCOL

MANEJO DE LA ECOGRAFÍA POR EL PERSONAL DE ENFERMERÍA EN LA VALORACIÓN DEL RESIDUO URINARIO: PROTOCOLO DE REVISIÓN DEL ALCANCE

GESTÃO DA ULTRASSONOGRAFIA POR ENFERMEIROS NA AVALIAÇÃO DO RESÍDUO URINÁRIO: PROTOCOLO DE REVISÃO DE ESCOPO

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Submission: 04-05-2025

Approval: 11-09-2025

ABSTRACT

Introduction: The use of bedside ultrasound (US), known as point-of-care ultrasound (POCUS), by nurses enhances the accuracy of clinical assessments and promotes greater safety in nursing interventions. However, there is still limited clarity on how this practice has been organized and integrated into nursing workflows, particularly regarding the evaluation of urinary retention in hospitalized patients. **Objective:** To map how nurses organize bedside ultrasound practice for the assessment of post-void residual urine in hospitalized adult patients. **Method:** This is a scoping review guided by the Joanna Briggs Institute (JBI) methodology and the PRISMA-ScR checklist. The review question was structured using the PICo acronym: P (Population) – hospitalized adult patients with urinary retention or at risk of retention; I (Phenomenon of Interest) – bedside US performed by nurses; Co (Context) – protocols, checklists, training programs, and implementation of nurse-led ultrasound teams. The literature search will be conducted in the following databases: Virtual Health Library (VHL), PubMed, CINAHL, Scopus, Web of Science, and Embase, in addition to an analysis of relevant legislation and grey literature such as manuals and guidelines. Study selection will be performed by two independent reviewers using Rayyan®, with disagreements resolved by a third reviewer. Data extraction will follow a tool developed by the authors. Included studies will be categorized based on how nursing work is organized for bedside ultrasound in residual urine evaluation. Methodological quality will be assessed using JBI tools. **Results:** The results will be presented in tabular and narrative formats to answer the review question and achieve the proposed objective.

Keywords: Nursing Assessment; Urinary Retention; Ultrasonography; Nursing.

RESUMEN

Introducción: El uso de la ecografía a pie de cama (ultrasonido point-of-care, POCUS) por parte de enfermeros mejora la precisión de las evaluaciones clínicas y promueve una mayor seguridad en las intervenciones de enfermería. Sin embargo, todavía existe poca claridad sobre cómo esta práctica ha sido organizada e incorporada al proceso de trabajo de la enfermería, especialmente en la evaluación del residuo urinario en pacientes hospitalizados. **Objetivo:** Mapear cómo los enfermeros organizan la práctica de la ecografía a pie de cama para la evaluación del residuo urinario en pacientes adultos hospitalizados. **Método:** Se trata de una revisión de alcance guiada por la metodología del Joanna Briggs Institute (JBI) y el checklist PRISMA-ScR. La pregunta de revisión fue estructurada según el acrónimo PICo: P (Población) – pacientes adultos hospitalizados con retención urinaria o riesgo de retención; I (Fenómeno de interés) – ecografía a pie de cama realizada por enfermeros; Co (Contexto) – protocolos, listas de verificación, capacitaciones e implementación de equipos de ecografía liderados por enfermeros. La búsqueda se realizará en las bases de datos Biblioteca Virtual en Salud (BVS), PubMed, CINAHL, Scopus, Web of Science y Embase, además del análisis de legislación pertinente y literatura gris, como manuales y guías. La selección de estudios será realizada por dos revisores independientes, utilizando Rayyan®, y los desacuerdos se resolverán con un tercer revisor. La extracción de datos utilizará un instrumento desarrollado por los autores. Los estudios incluidos serán categorizados según las formas de organización del trabajo enfermero en la realización de ecografía para evaluación del residuo vesical. La calidad metodológica se evaluará con herramientas del JBI. **Resultados:** Los resultados se presentarán de forma tabular y narrativa, con el fin de responder a la pregunta de revisión y alcanzar el objetivo propuesto.

Palabras clave: Evaluación en Enfermería; Retención Urinaria; Ultrasonografía; Enfermería.

RESUMO

Introdução: A aplicação da ultrassonografia (USG) à beira leito por enfermeiros, conhecida como point-of-care ultrasound (POCUS), aprimora a precisão das avaliações clínicas e promove maior segurança nas intervenções de enfermagem. No entanto, há pouca clareza sobre como essa prática tem sido organizada e incorporada ao processo de trabalho da enfermagem, especialmente na avaliação do resíduo urinário em pacientes hospitalizados. **Objetivo:** Mapear como os enfermeiros organizam a prática da USG à beira leito para avaliação do resíduo urinário em pacientes adultos hospitalizados. **Método:** Revisão de escopo conduzida conforme diretrizes do Joanna Briggs Institute (JBI) e checklist PRISMA-ScR. A questão de revisão foi estruturada segundo o acrônimo PICo: P (população) – pacientes adultos hospitalizados com retenção urinária ou risco de retenção; I (fenômeno de interesse) – USG à beira leito realizada por enfermeiros; Co (contexto) – protocolos, checklists, treinamentos e implementação de equipes de USG conduzidas por enfermeiros. A busca será realizada nas bases BVS, PubMed, CINAHL, Scopus, Web of Science e Embase, além da análise de legislações e literatura cinzenta, como manuais e guidelines. A seleção dos estudos será conduzida por dois revisores independentes, com auxílio do software Rayyan®, e divergências serão resolvidas por um terceiro revisor. A extração dos dados será feita por instrumento elaborado pelos autores. Os estudos serão organizados por categorias relacionadas à gestão do trabalho do enfermeiro na realização da USG à beira leito. **Resultados:** Serão apresentados de forma tabular e narrativa, visando responder à questão de revisão e alcançar o objetivo proposto.

Palavras-chave: Avaliação em Enfermagem; Retenção Urinária; Ultrassonografia; Enfermagem.



INTRODUCTION

Ultrasound (US) has become an essential tool in patient care, used both to guide invasive procedures and for assessment in various clinical settings^(1,2). In nursing, the use of ultrasound (US) has contributed significantly to care practice, providing nurses with a safer and more effective way to make decisions compared to traditional clinical methods⁽³⁾.

The use of ultrasound by nurses at the bedside, known as point-of-care ultrasound (POCUS), improves the accuracy of clinical assessments and provides greater safety in nursing interventions⁽⁴⁾.

Recognizing nursing's advancement in incorporating technologies into care, the Federal Nursing Council (Cofen) established Resolution No. 679 in 2021, regulating the performance of ultrasound by nurses at the bedside and in pre-hospital settings⁽⁵⁾. This standardization guarantees legal support for the practice, strengthening professional autonomy and expanding the possibilities for nurses' clinical practice.

Among the various practices in this context, bladder ultrasound assessment has emerged as a relevant intervention, since urinary problems, such as urinary retention (UR), are common and require specific measures for their prevention, mitigation, or resolution⁽³⁾. Although there is still no clear consensus in the literature on the ideal volume to define UR, some research indicates that values between 300 and 600 ml

can be considered indicative of this condition⁽⁶⁻⁸⁾.

The use of bladder ultrasound by nurses has been described in the literature since the 1990s, and this technology allows for estimating urinary volume without the need for bladder catheterization, reducing the risk of urinary infections and providing greater patient comfort^(3,4,9).

In patients undergoing surgical procedures, the emergence of postoperative full bladder syndrome, known as POUR, is relatively common. This condition is characterized by difficulty or inability to urinate, even with a full bladder, within four hours after surgery^(10,11). The frequency of this occurrence varies greatly, affecting 5% to 84% of patients in the first 24 hours after the procedure, depending on the type of surgery performed^(10,11). The most common signs and symptoms include abdominal discomfort, pain, a feeling of fullness, and a palpable bladder⁽¹⁰⁾.

When UR is identified, the nurse should perform a history and physical examination. However, these methods can be influenced by the patient's clinical condition, compromising the accuracy of the Nursing Diagnosis (ND). In this scenario, POCUS emerges as a fundamental imaging technology for assessing urinary volume, aiding in clinical decision-making⁽¹²⁾.

Despite the benefits of bedside ultrasound, its adoption still faces challenges, such as a lack of equipment, a shortage of trained nurses, and the absence of clear guidelines for

organizing this practice⁽⁴⁾. Therefore, it is essential to understand the strategies adopted by nurses to structure the management and application of ultrasound in the assessment of urinary residue.

A preliminary search was conducted on March 11, 2025, in the Medical Literature Analysis and Retrieval System Online (MEDLINE/PubMed), Cochrane Database of Systematic Reviews, Open Science Framework (OSF), Virtual Health Library (VHL), and CINAHL (EBSCO). No recent or ongoing systematic or scoping reviews on the topic were identified. This lack of studies highlights a knowledge gap, reinforcing the need for this scoping review.

Focusing on understanding practice management strategies, including protocols, training, and supervision, this study aims to "Map how nurses manage their practice for the use of bedside ultrasound for the assessment of urinary residue in hospitalized adult patients."

MATERIAL AND METHOD

This scoping review protocol follows the Joanna Briggs Institute (JBI) framework⁽¹³⁾, encompassing five steps: (1) defining the research question, (2) identifying relevant studies, (3) selection, (4) extraction, and (5) synthesis of studies. The drafting will be guided by the Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) checklist⁽¹⁴⁾.

Registration Protocol

This protocol was developed and registered with the Open Science Framework (OSF) under DOI 10.17605/OSF.IO/F47VS.

Review Question

To formulate a review question, we used the mnemonics P (population), I (phenomenon of interest), and Co (context), which guide the inclusion criteria and the mapping of terms to define the search strategy. In this study, the definition was as follows: P (population) – Adult patients over 18 years of age, hospitalized, with urinary retention or at risk of urinary retention; I (phenomenon of interest) – Bedside ultrasound performed by nurses; and Co (context) – Protocols, checklists, training, and implementation of ultrasound teams by nurses. The research question formulated was: "How do nurses organize the use of bedside ultrasound for the assessment of urinary residue in hospitalized adult patients?"

Eligibility Criteria

Studies addressing protocols, checklists, training, and other approaches for the implementation of nurse-performed ultrasound for the assessment of bladder residue in adults over 18 years of age will be included, with no restrictions on the area of specialty, as long as the original study design was in Portuguese.

The research will include scoping reviews, systematic reviews, integrative

literature reviews, expert opinions, and methodological studies with experimental or quasi-experimental designs. Studies without randomization, with single-group pre- and post-tests, time series, or case-control studies, indexed in databases in English, Spanish, or Portuguese, will also be accepted, provided the original version is in Portuguese and focused exclusively on the nursing field.

Resolutions and Opinions of the Federal Nursing Council (Cofen) and Regional Nursing Councils (CORENs), obtained through searches on these entities' websites, will also be included.

Studies that do not present a clearly defined methodology, as well as theses, dissertations, and research that do not address the use of ultrasound by nurses, will be excluded.

Search Strategy

The initial search was conducted using the databases of the Brazilian Ministry of Health's Virtual Health Library (BVS), the National Library of Medicine (PubMed), The Cumulative Index to Nursing and Allied Health Literature (CINAHL), Scopus, Web of Science, and Embase. The selection of controlled descriptors was based on the terms Health Sciences Descriptors (DeCS) and MESH (Medical Subject Headings). The controlled descriptors presented in Figure 1 will be used with the Boolean operators "AND" and "OR" during the searches. The initial search strategy was adjusted for each database, and no filters were used (Figure 2) and (Figure 3).

Figure 1 - PICO Strategy / Controlled Descriptors

PICO Strategy		DECS Descriptors	MESH Descriptors
P	Adult patients over 18 years of age hospitalized with urinary retention or risk of urinary retention.	Urinary Retention	Urinary retention
I	Bedside ultrasound performed by nurses	Ultrasonography Ultrasonography, Interventional	Ultrasonography Ultrasonography, Interventional
Co	Protocols, checklists, training, implementation of USG teams by nurses.	• Clinical Protocols • Validation Study • Nursing Assessment • Nursing.	- Clinical Protocols - Validation Study - Nursing assessment - Nursing

Source: Research data, 2025.

Figure 2 presents the descriptors used in the search strategy for each database consulted.

The terms were selected based on scientific literature and controlled vocabularies, such as

Medical Subject Headings (MeSH) and Health Sciences Descriptors (DeCS). The combination of descriptors was adjusted according to the

specifics of each database, ensuring greater comprehensiveness and accuracy in retrieving studies relevant to this review.

Figure 2 – Descriptors used in the database search strategy.

Sources of information	Descriptors used
CINAHL	- urinary retention AND ultrasonography AND nursing - urinary retention AND nursing assessment AND ultrasonography
PubMed	- Search: ((urinary retention) AND (Nursing)) AND (Ultrasonography) - Search: ((urinary retention) AND (Nursing assessment)) AND (ultrasonography) - Search: ((urinary retention) AND (Nursing)) AND (Ultrasonography)
BVS	- (avaliação em enfermagem) AND (retenção urinária) AND (ultrassonografia) - (ultrassonografia) AND (Enfermagem) AND (retenção urinária)
Google Scholar	- urinary retention AND Nursing AND Ultrasonography

Source: Research data, 2025.

Figure 3 illustrates the search strategy model adopted to retrieve relevant documents. The strategy was structured with a combination of specific descriptors and Boolean operators, adjusted according to the specificities of each

database consulted. This model aims to optimize the accuracy and comprehensiveness of searches, ensuring the inclusion of studies relevant to the topic addressed in this review.

Figure 3 – Search strategy model for document retrieval.

DATABASE	Search key
PubMed	("nursing"[MeSH Terms] OR "nursing"[All Fields] OR "nursings"[All Fields] OR "nursing"[MeSH Subheading] OR "nursing s"[All Fields]) AND ("diagnostic imaging"[MeSH Subheading] OR ("diagnostic"[All Fields] AND "imaging"[All Fields]) OR "diagnostic imaging"[All Fields] OR "ultrasonography"[All Fields] OR "ultrasonography"[MeSH Terms] OR "ultrasonographies"[All Fields]) AND ("urinary retention"[MeSH Terms] OR ("urinary"[All Fields] AND "retention"[All Fields]) OR "urinary retention"[All Fields])

Source: Research data, 2025.

Study/Selection of Evidence Sources

The search will be conducted between April and August 2025, with the support of a librarian. The studies found will be recorded and organized using Rayyan® software ⁽¹⁵⁾. In the first stage of the analysis, two reviewers will evaluate the articles based on their title and abstract, excluding those that do not address the study question.

The reviewers will then analyze the full texts of the selected articles. Those that do not answer the study questions will also be discarded. If disagreements arise between the reviewers during the selection process, they will be resolved through discussion or with the assistance of a third reviewer. The texts considered acceptable will be selected for data extraction.

Data Extraction

In this stage, the selected texts will be read and interpreted using an Excel spreadsheet previously developed by the authors to collect the information necessary for the analysis. The data collected will include: authors, year of publication, country, objectives, study types, population and sample, and recommended best practices. The study question will serve as a guide for the data collection and analysis technique.

Analysis and Presentation of Evidence

The data will be presented in the form of charts and tables, complemented by a descriptive summary that demonstrates how the results relate to the review objective and question. The methodological quality of the included studies will be analyzed using the Joanna Briggs Institute (JBI) tools, which assess aspects such as the risk of bias and the validity of the methodologies employed. This analysis will ensure the robustness and reliability of the evidence found.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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Funding:

This research received no funding.

Authorship Criteria (Author Contributions)

Authorship designation should be based on ICMJE guidelines, which consider an author to be someone who: 1. makes a substantial contribution to the conception and/or planning of the study; 2. contributes substantially to the acquisition, analysis, and/or interpretation of the data; 3. contributes to the drafting and/or critical review and final approval of the published version.

Amanda Dias de Souza and Paula Vanessa Peclat Flores met all the aforementioned criteria.

Conflict of Interest Statement

We declare that we have no conflicts of interest.

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