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Exploring nurses' holistic understanding and practice of debridement methods in hospital wound care: A phenomenological study

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Abstract

Safety debridement is an important part of wound care, but in practice, nurses face various challenges. Then, a deep understanding of nurses' experiences is needed to develop safe and effective wound care standards in accordance with standard clinical techniques. However, qualitative research exploring nurses' experiences with debridement is still very limited in the literature. This study aims to delve into how practitioners holistically understand and apply debridement, with a secondary focus on identifying standardized debridement methods and prevalent barriers to clinical practice. This study employed a phenomenological qualitative design to achieve its objectives. Data collection occurred from December 2024 to January 2025 at Arifin Achmad Regional General Hospital in Riau, Indonesia. Participants were selected using a purposive sampling method based on specific eligibility criteria. The inclusion criteria comprised nurses who have performed debridement and are currently assigned to relevant clinical wards. Conversely, the exclusion criteria were applied to nurses who are not directly involved in wound care. A total of 14 wound care nurses participated in the study. Following the receipt of ethical clearance, data were collected through in-depth interviews and analyzed using Colaizzi's phenomenological method. The analysis gathered three primary themes: hospital-based debridement methodologies, the authority and competence of practitioners, and barriers to the implementation of safe debridement practices. Findings revealed that nurses frequently managed chronic diabetic foot ulcers, pressure injuries, and necrotic surgical wounds. For these cases, mechanical debridement emerged as the most frequently utilized method of wound bed preparation. The researchers identified both structural and technical barriers to effective practice. These findings emphasize the urgent need to strengthen nurses' competencies through relevant wound care training.

Keywords: Methods of debridement, phenomenological study, safety, wound care, wound healing

Introduction

Wound care is an important aspect of nursing practice that requires clinical judgment, technical proficiency, and an in-depth understanding of tissue repair (Sussman, 2023). Acute wounds are typically managed using modern dressing techniques, including thorough cleansing and appropriate bandaging (Olutoye et al., 2024). In contrast, chronic wounds require more complex interventions, specifically debridement, to remove non-viable tissue and facilitate healing (Eriksson et al., 2024). Chronic wounds represent a global health challenge that impacts patient morbidity, extending hospitalizations, and escalating healthcare expenditures (Redmond et al., 2025). The prevalence of chronic wounds affects approximately 6.5 million people annually, with an estimated 15% to 34% of this population specifically experiencing diabetic foot ulcers (DFU) (Sen, 2025). A wound is defined as chronic if it fails to resolve within a 4–6-week timeframe due to a combination of complex clinical pathways (Sen, 2021). Chronic wounds are often accompanied by dead tissue such as necrotic tissue, slough, or biofilm, that must be removed to restore the viability of the wound bed (Riza et al., 2025). In these cases, debridement is important to reduce microbial load, prevent infection, and prepare the wound bed for re-epithelialization (Murphy et al., 2020). Debridement is executed when the wound shows necrosis, slough, biofilm, or impaired healing that leads to delayed healing or infection (Nowak et al., 2022). Current international guidelines emphasize that debridement should be performed when there is non-viable tissue, risk of infection, or issues on wound edges (Mayer et al., 2024). The primary aim of debridement is to remove devitalized tissue—which otherwise

serves as a reservoir for bacteria and a barrier to repair—thereby creating an optimal environment for the re-epithelialization process to proceed (Thomas et al., 2021).

Debridement entails risks such as bleeding and healthy tissue damage; therefore, utilizing safe techniques is essential to preserve the wound bed and promote healing. Safe debridement practices emphasize patient safety in the procedure of cleaning necrotic or infected tissue to avoid tissue complications (Melnychuk, 2024). This practice requires special skills and knowledge because it carries the clinical risk for healthy tissue. Therefore, nurses have a responsibility to perform safe debridement in accordance with practice standards (Dayya et al., 2022). Nurses play an important role in practicing various types of debridement, such as mechanical, autolytic, and enzymatic methods (Atkin & Ousey, 2016). Their responsibilities include evaluating wounds, selecting debridement methods, managing pain and asepsis, monitoring responses, and providing patient education. Recent studies emphasize that competent wound care nurses must be proficient in identifying wound bed readiness, assessing vascular status, and proactively preventing procedure-related complications (Tran et al., 2023; Rajhathy et al., 2024). The implementation of safety debridement includes a comprehensive evaluation of the wound and patient condition, obtaining informed consent, the use of analgesia/anesthesia, sterile techniques, and complete documentation (Thomas et al., 2021). Nurse safety aspects are also important, including the use of personal protective equipment (PPE), instrument sterilization, ergonomic work posture, and aseptic techniques to prevent cross-infection (Pei & Song, 2025). When performed correctly, safety debridement can prevent infections, accelerate tissue regeneration, and reduce pain (Rajhathy et al., 2021). Conversely, improper application increases the risk of complications, such as secondary infection, trauma to viable tissue, and delayed wound healing.

As the primary caregivers responsible for daily wound management, nurses are uniquely positioned to monitor the state of the wound bed and determine the optimal intervention. Consequently, the safety and efficacy of the debridement process are dependent on the nurse's specialized knowledge and their ability to integrate evidence-based practices into routine bedside care. For instance, within the Indonesian legislative framework, Law No. 17 of 2023 and Ministry of Health Regulation No. 26 of 2019 mandate that advanced procedures, such as debridement, be performed exclusively by competent nurses who have completed specialized training and secured the necessary licensure. Current regulations mandate that invasive methods, particularly sharp debridement, are performed under the oversight of experts. Variations in wound care practices have not been standardized and are not yet fully evidence-based, with variations in practice influenced by limited access to clinical guidelines, wound assessment tools, and available clinical resources and infrastructure (Hulbert-lemmel et al., 2024). Differences in the availability of medical resources, the level of nurse training, and workplace support are the main factors causing inconsistencies in wound care practices. This condition indicates that in the context of developing countries such as Indonesia, the implementation of wound care practices has the potential to vary greatly between health care facilities, depending on the readiness of the clinical infrastructure and medical resources available. A literature review shows that most studies on debridement focus on the effectiveness of methods, wound care techniques, or patient outcomes, but the aspect of nurses' experiences is still rarely explored in depth. Study indicated that nurses play a crucial role in the assessment, planning, and implementation of wound care, including various types of debridement such as mechanical, autolytic, and enzymatic methods (Atkin & Ousey, 2016). Study shows that nurses' direct experience in treating wounds greatly influences how they assess risk, select debridement techniques, and prioritize care (Lee & Chang, 2023). This experience includes nurses' perceptions of patient safety, patient comfort, and the professional meaning of wound care practice. However, existing literature has yet to explore the lived experiences of nurses regarding debridement, particularly how they navigate complex clinical decision-making and the emotional, technical, and ethical dilemmas encountered in their daily practice. A study indicates that nurses' firsthand experience in wound care shapes their clinical judgment, specifically regarding risk assessment, debridement selection, and care prioritization (Lee & Chang, 2023). The experience encompasses both the technical execution of treatment and the subjective perceptions of safety, patient comfort, and the deeper professional significance of wound care.

In debridement practice, a holistic approach requires viewing the patient as a whole by integrating physical, psychological, social, spiritual, and environmental dimensions. The perspective is vital because debridement often triggers pain, anxiety, and fear. Furthermore, social and familial dynamics play a critical role in determining treatment compliance (Diannita et al., 2023). Just as the environment and facilities dictate the choice of debridement method, a nurse's perceptions and experience determine the quality of patient interaction, education, and safety during the procedure (Liosatos et al., 2024). A holistic understanding enables nurses to conduct comprehensive assessments, select the safest methods, and provide emotional support. A preliminary study conducted in December 2024 at RSUD Arifin Achmad revealed a significant training gap: only five of the 23 nurses were certified in wound care. Despite this lack

of formal certification, all nurses consistently performed wound care procedures such as mechanical debridement. Although alternative methods like chemical, biological, and autolytic debridement were feasible, their implementation remained limited by equipment constraints, facility availability, and a lack of competency. Thus, exploring nurses' experiences in debridement practice is of critical importance. This study is significant because it bridges the gap between technical wound care and the psychological or social needs of the patient and ensures that debridement is treated as a human experience rather than just a clinical procedure. Through exploring nurses' experiences, the research identifies how professional meaning and institutional constraints (e.g., limited certification and equipment) shape the quality of wound care.

Method

The study employed a qualitative design with a phenomenological approach. The selection of the design was appropriate as it is able to explore the lived experiences of individuals through a process of interpretation, reflection, and description (Whitfield et al., 2023). The study focuses on exploring nurses' experiences with debridement techniques in wound care procedures. The project was conducted at Arifin Achmad General Hospital from December 2024 to January 2025. The population consisted of all nurses proficient in managing both acute and chronic wounds. Participants were selected using purposive sampling according to the inclusion and exclusion criteria. The inclusion criteria were employment at Arifin Achmad Regional General Hospital, having experience in performing debridement, open to both Certified Wound Care Clinical Associate (CWCCA) certification and non-certified nurses, provided they consented to in-depth interviews and were able to communicate in the study's designated language. At the same time, the exclusion criteria were nurses who were not involved in wound care, such as administrative nurses or educators. A total of 14 nurses participated in the study, comprising 12 primary participants (practicing nurses) and two supporting informants (room team leaders). The sample size was determined by data saturation, the point at which no new information or themes emerged from the interviews. The methodology is consistent with established qualitative standards that participant numbers in qualitative research remain flexible and are dictated by the depth and saturation of the data (Rahimi & Khatooni, 2024).

Data were collected through semi-structured, in-depth interviews guided by a pre-designed protocol. To ensure that nursing services remained uninterrupted, interviews were scheduled according to participants' availability, occurring during work breaks, following shift handovers, or at the conclusion of working hours. The timing was arranged through personal appointments with the participants. The duration of the interviews was adjusted to the phenomenological research standard of 45–60 minutes (Dicicco-Bloom & Crabtree, 2006; Jamshed, 2014). The entire process was recorded with the participants' consent or approval. The interview guidelines were developed based on a phenomenological framework and safety debridement method. Safe debridement refers to wound debridement practices that consider patient safety, clinical competence, infection prevention, and adherence to established wound care guidelines (Dayya et al., 2022). Before implementation, the interview guide was validated by two external experts such as a certified medical-surgical nurse/lecturer (CWCCA-certified) and a lecturer specializing in qualitative research methodology. The validation process included assessing the clarity of language, the relevance of questions to the research objectives, and the depth of exploration of the phenomenon. An eight-item interview guide was validated by these experts for use in the current research. The questions were: had you ever attended wound care training, or are there specific criteria for nurses who are authorized to perform debridement? Can you describe what you know about debridement? What about debridement safety? Can you share your experience in performing debridement? How did your colleagues respond when you performed debridement? Can you share that? Are there any obstacles in performing debridement? In your opinion, are special skills training important in debridement? What are your expectations for the future regarding debridement performed by nurses?

During data collection, the researchers also observed participants' non-verbal responses, such as facial expressions, vocal intonation, body language, and meaningful silences. Supporting documents and voice recorders were also used. Observations were used as contextual data to reinforce the meaning of verbal narratives. Integration was achieved by connecting verbal statements with the participants' expressions and emotions during the interview process. Furthermore, nonverbal cues were integrated into the analysis units where emotional meaning influenced the interpretation of phenomena, with all findings subsequently verified through member checking. Data analysis was conducted with the following stages such as verbatim transcription of interview results, identification of significant statements, formulation of meaning, grouping into themes, compiling a comprehensive description of the phenomenon, and compiling a final report (Morrow et al., 2015; Northall et al., 2020). At this stage, the researcher noted initial impressions regarding understanding of the debridement method, challenges, and safety procedures. All statements relevant to nurses' experiences, the meaning of debridement, implementation procedures, obstacles, and competencies

were highlighted. Significant statements were then formulated into implied meanings. These meanings were compared between participants to find consistency. The meanings were organized into categories and sub-themes. The coding process was performed manually to preserve the integrity and nature of the participants' meanings. To ensure interpretative accuracy, validation was conducted via member checks with the participants, specifically involving two head nurses who served as key informants. Following the member checks, the researchers refined the thematic structure to reflect the consensus between the participants' accounts and the emerging analytical insights. This rigorous verification process ensured that the findings remained grounded in the actual lived experiences of the nurses rather than researcher bias. Consequently, the final themes achieved a high degree of credibility and trustworthiness, providing a robust foundation for the study's conclusions.

Rigor and trustworthiness of the study were achieved by credibility, transferability, dependability, and confirmability (Johnson et al., 2020). Credibility was established through prolonged field engagement and member checking, where two participants reviewed the interpreted meanings to confirm they aligned with their lived experiences. Furthermore, the researchers utilized peer debriefing and source triangulation by comparing the nurses' data with the perspectives of a certified lead nurse. Transferability was maintained by providing thick, contextual descriptions of the research setting and participant characteristics to allow for application in similar clinical contexts. These descriptions included specific details such as the participants' education, work experience, certification, alongside data regarding the hospital setting, unit types, and the variety of wounds treated. Dependability was established through a systematic audit trail and consistent procedural reviews conducted by the supervising faculty. This audit trail included raw interview transcripts, field notes, interview guidelines, and a record of the data analysis process. Confirmability is maintained through documentation of findings, field notes, and audit trails, as well as triangulation among participants. Direct quotes from participants are used to show that findings originate from the data, not researcher bias. All analytical decisions are clearly documented. The researcher's reflective notes are kept to minimize subjectivity.

Ethical approval for this study was granted by the Health Research Ethics Committee of Hang Tuah University Pekanbaru (No. 550/KEPK/UHTP/XII/2024). The study was conducted in strict accordance with the fundamental ethical principles of beneficence, non-maleficence, autonomy, and justice (Varkey, 2021). Beneficence promotes the "well-being" of the nursing profession by identifying barriers to safe debridement. Though participants may not benefit directly, the findings contribute to improved clinical guidelines and better wound healing acceleration. The non-maleficence principle ensured that interviews were conducted in a private and supportive environment. Participants were informed that their honest reflections on practice errors or barriers would not impact their professional standing. Autonomy was implemented by respecting the participants' "self-determination" through an informed consent process. Each nurse was informed of their right to withdraw from the study at any time without penalty or the need for justification. Justice was maintained through the purposive sampling process to make sure that the participant selection was based on clinical expertise (experience in debridement) rather than personal bias.

Results

The table presented that twelve nurses participated in the study, all of whom had experience performing debridement in a ward setting. Despite varying levels of CWCCA certification, every participant was proficient in mechanical debridement techniques (**Table 1**). Additionally, the participant characteristics included two nursing team leaders who served as supporting participants. Both leaders held CWCCA certification and were experienced in performing both traditional and modern debridement techniques (**Table 2**). Data depth was achieved through several targeted strategies. First, as the participants were direct implementers of debridement, their responses provided highly specific, experience-based insights that facilitated rapid data saturation. Furthermore, the use of focused probing ensured that each response remained aligned with the research objectives—specifically exploring the experiences, perceptions, and meanings of safe debridement practices. To enhance rigor, triangulation was conducted with two nursing team leaders to confirm and strengthen the analysis. Finally, field notes were utilized to capture non-verbal context, while member checks ensured that the final analysis accurately reflected the participants' intended meanings. The clustering process was conducted based on similarities in meaning.

From the process, the researchers identified three themes, including methods of debridement practices used in hospitals, the authority and competence of those performing debridement practices and obstacles faced by nurses in implementing debridement practices (**Figure 1**). The themes were developed based on participant responses and aligned with the research objectives. The researchers synthesized these findings into a comprehensive description of the experiences, integrating direct quotes, formulated meanings, and theme clusters into a cohesive narrative. For instance, the first theme highlights that mechanical debridement was the predominant method due to resource availability.

Conversely, autolytic and enzymatic methods were rarely utilized due to facility limitations, while surgical debridement remained strictly within the scope of medical practitioners. The researchers provided a detailed account of the findings, eventually synthesizing them into their essential structures.

The first theme is the debridement practice methods used in hospitals. This theme describes nurses' understanding of debridement practices and methods. Participants described debridement as the removal of necrotic tissue to improve wound vascularization and accelerate healing.

"Debridement is wound care in which we remove necrotic tissue" (PU8).

"To accelerate the healing of the wound. Because there is infection, there is infection in the wound... If debridement is performed, the surrounding area is cut or incised so that healing is much faster, that's the most obvious thing, right?" (PU12).

Table 1. Characteristics of the participants.

No	Age	Sex	Education	Experience (years)	CWCCA certification	Debridement practices*
PU1	39	Female	Bachelor	15	Yes	MD
PU2	48	Female	Diploma	23	Yes	MD
PU3	40	Male	Bachelor	16	Yes	MD
PU4	33	Female	Bachelor	7	No	MD
PU5	45	Female	Bachelor	20	Yes	MD
PU6	25	Female	Bachelor	2	No	MD
PU7	41	Female	Diploma	6	No	MD, CD
PU8	27	Female	Bachelor	4	No	MD
PU9	26	Female	Bachelor	3	No	MD, CD
PU10	28	Female	Bachelor	5	No	MD
PU11	55	Male	Diploma	33	Yes	MD
PU12	30	Female	Diploma	10	No	MD

*MD: Mechanical debridement; CD: Chemical debridement.

Table 2. Characteristics of the supporting participants.

No	Age	Sex	Education	Experience (years)	CWCCA certification	Debridement practices*
PU13	41	Female	Bachelor	14	Yes	MD
PU14	42	Female	Diploma	21	Yes	MD, AD

*MD: Mechanical debridement; AD: Autolytical debridement.

Participants also emphasized the need for specific criteria to determine whether debridement is necessary based on wound characteristics.

"The shape of the wound, whether it is infected, necrotic, greenish, or yellowish, then we need to look at its width, depth, and area" (PU6).

"Usually, if we find dead tissue that is black or white, and there is no blood flow" (PU7).

Nurses are aware of several debridement methods available in hospitals, although their application depends on the doctor's instructions.

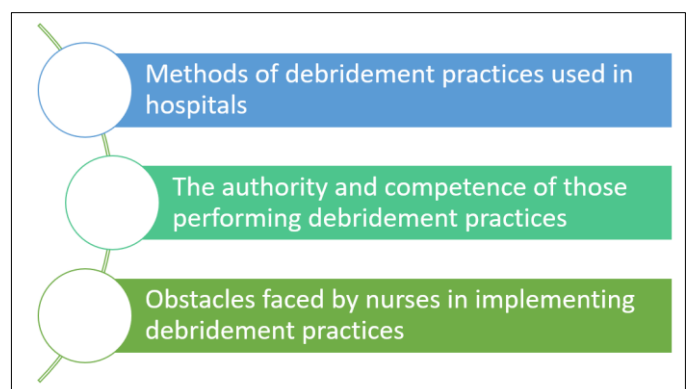


Figure 1. Themes (Generated by authors).

"There are five types of debridement here: mechanical debridement, autolytic debridement, biological debridement, enzymatic debridement, and surgical debridement. Mechanical debridement is usually used" (PU1).

From the nurses' perspective, debridement is defined as a specialized wound care procedure for chronic conditions, involving the removal of necrotic tissue to facilitate accelerated healing. These nurses demonstrate a clear understanding of the clinical characteristics that necessitate such intervention. Though debridement methods vary, they consistently adhere to established hospital protocols and the professional responsibilities associated with patient care. Various methods are available to facilitate debridement that categorized into medical and non-medical approaches. Medical debridement includes surgical debridement and Conservative Sharp Wound Debridement (CSWD). Conversely, non-medical approaches comprise mechanical, chemical, biological, and autolytic methods. The study identified four specific sub-themes: mechanical, chemical/enzymatic, autolytic, and surgical debridement. Though participants demonstrated comprehensive knowledge of these methods, their practical application was often constrained by facility-specific limitations and resource availability. Mechanical debridement was obtained as the first subtheme, illustrated by the keywords gauze/moist, dry technique, and sterile technique. The mechanical debridement technique category was revealed by participants. Participants indicated that mechanical debridement is the most prevalent method, primarily because it requires only standard wound care equipment. This includes a sterile dressing kit composed of surgical scissors, tweezers, gauze, an instrument tray, and sterile gloves, along with sterile saline (NaCl) and cotton wool.

"Mechanical debridement using the gauze technique" (PU1).

"Mechanical debridement, there are several types, basically several types of debridement, this one is light debridement, what is it called, if it is maggots, this one is not, the mechanical one" (PU3).

"The procedure is performed with the correct principles and techniques, and it has been sterilized" (PU4).

"The tissue has been removed, and then we close the wound using the moist technique" (PU6).

"Moist gauze to soften it first, then we perform necrotomy with scissors as usual" (PU7).

"So, we perform the removal, we apply moist dressings, we perform the removal, we cut, and then we bandage it again" (PU8).

"As far as I know, debridement is still dry, so just apply Sofra Tulle. I know that wound care uses wound care equipment and sterile techniques, so that's it" (PU10).

The second subtheme is chemical/enzymatic debridement. Chemical/enzymatic is illustrated in the keyword honey. This category was expressed by two main participants as follows

"Sometimes when our doctor is a plastic surgeon, they usually use honey as an antiseptic, some use honey" (PU7).

"Sometimes the doctor also tells us how to clean it, for example, using honey, depending on whether the doctor wants to use honey or not" (PU9).

Participants noted that though chemical or enzymatic debridement is practiced within the hospital, its application is contingent upon a physician's orders. In this setting, medical-grade honey is the primary agent utilized for this method. Participants identified honey as a natural antiseptic and antimicrobial agent that facilitates debridement and promotes accelerated wound healing.

The third sub-theme identified is autolytic debridement. Participants noted that while this method is utilized within the hospital, its application is infrequent due to significant equipment and supply limitations. Consistent with hospital protocols, autolytic debridement is performed according to the physician's instructions. Participants identified the primary materials used for this process as modern dressings, including calcium alginate, hydrogels, and absorbent dressings, as well as medicated paraffin gauze such as Sofra Tulle.

"We use modern dressings such as alginate, which can absorb" (PU3).

"There is a special absorbent pad that we sometimes use, depending on the shape of the wound" (PU6).

The final sub-theme focuses on surgical debridement. Participants identified this method as the standard for managing extensive wounds that are typically performed by surgeons within the operating room. They noted that anesthesia is essential during these procedures for pain management. Furthermore, participants emphasized that surgical debridement falls exclusively within the medical scope of practice and authority of doctors. This sub-theme is underscored by the recurring mention of these sterile instruments as the primary requirement for the procedure."

"Sterile instruments" (PU4).

"Sterile, using a sterile instrument set" (PU10).

"Sterile, if in the operating room, we don't really know" (PU12).

Surgical debridement remains the definitive method for managing severe or complex wounds. Participants noted that this advanced intervention is performed exclusively by surgeons. These observations were further supported by the patients' non-verbal cues; their serious expressions and reactions underscored the reality that surgical debridement is reserved for high-acuity cases. According to participant testimony, mechanical debridement—utilizing wet-to-dry gauze techniques and standard sterile wound care kits—is the most employed method in the ward.

The subsequent theme identified was authority and competence in debridement, which explored nurses' experiences regarding their professional scope and adherence to hospital standards. Participants indicated that debridement is performed by nurses who possess the requisite competence and clinical experience. Specifically, nurses are expected to undergo advanced training in basic wound care and debridement techniques. Regarding clinical autonomy, nurses are authorized to perform mechanical debridement; however, medical debridement remains strictly within the scope of practice for physicians.

"Because nurses don't have the tools to perform debridement in the operating room. We usually use mechanical debridement, which is the usual mechanical debridement" (PU1).

"It is usually done in the operating room, but if the wound is not too severe, we can perform a little debridement, just a light mechanical debridement" (PU3).

"In the operating room, we don't do it, we only treat the wound" (PU4).

"Our wound care here is not all like debridement wound care. We treat GV wounds the day after debridement" (PU6).

"Necrotomy is done by nurses" (PU7).

"Here, we only treat small wounds" (PU8).

"We treat all wounds the same way because each patient has different wounds. The important thing is to clean them. Some are oozing, some are festering, so we clean them until they are clean, then cover them again" (PU9).

"For regular wounds, they can usually be treated in a regular room" (PU10).

"As far as I know, we just treat the wounds, but the surgeon will recommend cutting them later" (PU12).

Participants explained that the combination of debridement techniques is implemented under medical supervision or direct physician orders, while also taking the nurse's clinical experience into account. However, cases involving severe wound conditions are managed exclusively by surgeons or the attending physicians responsible for the patient's care.

"With the doctor in the operating room, debridement is performed in the operating room...that is the doctor's job" (PU1).

"Debridement is performed by a Doctor of Professional Program Specialist (PPDS) in the operating room" (PU5).

"Debridement is specifically performed by surgeons who remove tissue in the operating room" (PU6).

"Usually in the operating room, the surgeon" (PU8).

"In the operating room, surgical procedures are performed by surgeons, not nurses, but surgeons" (PU12).

The final theme identified was nurses' barriers to performing debridement. These obstacles were categorized into four key areas: resource limitations, patient non-compliance, the risk of clinical complications, and challenges in maintaining sterility. Participants specifically highlighted the scarcity of advanced wound care supplies as a significant hurdle. They noted that while modern dressings facilitate superior healing and exudate management—reducing the frequency of dressing changes—facility constraints often force them to adapt by using more basic materials provided by the hospital.

"Well, that's the limitation of the apron. If there is wound care, there must be an apron. That's the limitation of the apron, but actually, there isn't one. What can we do? There must be one... But if the obstacle depends on the patient, if they really want it, then we cut it. Sometimes the patient doesn't want to feel pain, they say... Actually, I'm also afraid of bleeding... Afraid of cutting wrong, afraid of being stabbed, or sometimes the vein gets cut or something like that" (PU2).

"The procedure is not sterile, so wound care after surgery is also not sterile, so debridement is pointless... The biggest obstacle is indeed that patients who are not like this are less likely to undergo surgery... for example, children are fussier,

especially when wound care is at the threshold of the patient's pain tolerance, even a little cleaning causes them to complain of pain, so wound cleaning is not optimal, that's the obstacle" (PU4).

Participants identified patient non-compliance and procedural distress as significant challenges, particularly among pediatric patients whose lower pain tolerance often leads to restlessness. Such behavior frequently necessitates pausing the procedure until the patient is stabilized and cooperative. Additionally, clinical risks such as hemorrhage and infection were highlighted, especially in complex cases where debridement with conventional equipment in the operating room increases the risk of severe bleeding. Nurses also reported difficulty in differentiating between viable and non-viable necrotic tissue. Attempting to excise necrotic tissue that remains firmly integrated with healthy peri-wound skin can trigger sudden, extensive bleeding, forcing an unplanned cessation of the procedure.

"Because the equipment here is limited, we sometimes have difficulties because there is a lack of medical equipment. We have not yet performed modern wound care here. Because the equipment here is limited, perhaps this limitation also applies to modern wound care equipment. At most, sometimes the patient is uncooperative, then after that sometimes the patient cannot be persuaded to cooperate and cannot be persuaded to cooperate. Our difficulties are sometimes bleeding, sometimes if there is active bleeding, it is not cleaned immediately, we look at the bleeding first" (PU1).

In certain clinical settings, essential resources for rapid hemostasis are not always readily available, such as hemostatic agents, pressure bandages, or specialized surgical instruments. Failure to manage acute bleeding can result in blood loss, which compromises recovery, delays healing, and heightens the risk of infection.

Discussion

The findings indicate that nurses consistently rely on mechanical debridement as their primary method. Participants revealed that this preference is driven by the immediate availability of standard wound care kits in their hospital. Specifically, the wet-to-dry technique is most frequently utilized; this involves applying saline-moistened gauze to soften necrotic tissue, which is then covered with dry gauze to facilitate the mechanical removal of debris during dressing changes (Wodash, 2013). These findings align with existing literature, which indicates that mechanical debridement is predominantly utilized in resource-limited facilities. This preference is often because the procedure requires only standard wound care kits rather than advanced dressing technologies (Nowak et al., 2022). One study indicates that while mechanical debridement is relatively easy to implement, it carries a significant risk of tissue trauma and patient discomfort (Thomas et al., 2021; Stürmer et al., 2024). Participants reported that when performing mechanical debridement, they rely on established hospital standard operating procedures alongside their clinical intuition and prior experience. These combined elements serve as the primary framework for their wound care decision-making process (Tayyib & Ramaiah, 2021). Although most participants lacked formal certification, they were highly experienced and authorized to perform wound care utilizing mechanical debridement methods. Consequently, clinical decisions regarding wound management were predominantly guided by their extensive practical experience (Irestig et al., 2025). These findings align with research indicating that nurses often make decisions based on personal experience due to a lack of evidence-based standard protocols and limited training (Arends et al., 2022; Arra et al., 2022).

The research findings indicate that nurses perceive debridement as a wound-cleansing process, often equating it with surgical procedures or necrotomy. Fundamentally, debridement is a critical wound care intervention involving the removal of necrotic tissue, infectious material, and debris to accelerate the healing process (Dayya et al., 2022). This procedure accelerates tissue regeneration, reduces the risk of infection, and creates a wound environment conducive for granulation (Niederstätter et al., 2021). In terms of objectives, participants revealed that debridement was performed to accelerate granulation, prevent infection, and improve the overall condition of the wound. Participants also emphasized that this action plays an important role in accelerating new tissue formation and supporting optimal wound healing. Assessment of wound characteristics is also an important consideration in performing debridement (Zhao et al., 2024). Participants stated that not all wounds can be debrided immediately; an assessment of the type, shape, depth, and extent of the wound is necessary. This clinical evaluation ensures that the procedure is performed only when appropriate to address the underlying physiological barriers to healing. Therefore, a comprehensive evaluation of the wound is necessary before determining the appropriate debridement method to minimize risks such as pain or bleeding. As acknowledged, debridement is important as necrotic tissue can inhibit epithelialization and become a breeding ground for bacteria (Diefenbeck et al., 2013).

Debridement is divided into two main types: medical debridement (by doctors using sterile surgical instruments in operating rooms) and non-medical debridement (by other healthcare professionals using non-invasive approaches such as autolytic and biological) (Kementerian Kesehatan Republik Indonesia, 2024). A study classifies debridement based on its selectivity into selective (such as autolytic and enzymatic) and non-selective (such as mechanical) (Thomas et al., 2021). Findings reveal a gap in participants' knowledge regarding the formal classification of debridement. Although familiar with various technical methods, many nurses reported that insufficient training hindered their broader understanding of the field. This discrepancy between procedural skill and formal classification knowledge suggests that the practices may not fully align with legal or professional standards. Therefore, investment in clinical education is essential to bridge gaps and standardize debridement services. In addition to mechanical debridement, participants noted the use of chemical or enzymatic methods, typically performed under a physician's supervision. Among the materials utilized is medical-grade honey, which serves as a natural antiseptic and facilitates the wound-healing process. Existing literature indicates that enzymatic debridement utilizes proteolytic enzymes, such as collagenase or bromelain, to selectively dissolve necrotic tissue (Amadeh et al., 2025; Shoham et al., 2018). Furthermore, Manuka honey is increasingly recognized as an effective debridement agent; its hyperosmolar activity, acidic pH, and hydrogen peroxide content collectively accelerate autolysis while suppressing bacterial proliferation (Tashkandi, 2021; Kapoor & Yadav, 2021). Participants also identified autolytic debridement as a method, though its application remains limited by the suboptimal availability of modern dressings such as calcium alginate, hydrogel, and paraffin-medicated gauze. This technique relies on endogenous enzymes to liquefy necrotic tissue within a moist environment (Peng & Wen, 2017). Though autolytic debridement is appropriate for small and non-infected wounds, the process is inherently slow, and its efficacy depends heavily on wound moisture levels and the volume of necrotic debris.

Participants also identified surgical debridement as a utilized method, typically performed by physicians in the operating theater under anesthesia. They emphasized that this procedure remains the prerogative of medical doctors and is reserved for wounds characterized by severe infection or extensive necrotic tissue. Literature explained that surgical debridement involves the excision of tissue down to healthy tissue, requires surgical expertise, and is performed with sterile instruments in an operating room (Güven, 2024; Kementerian Kesehatan Republik Indonesia, 2024). Furthermore, this study identified a hybrid approach combining mechanical and surgical debridement methods. Participants revealed that under the guidance of the attending physician, they performed conservative sharp debridement by removing necrotic tissue with sterile scissors or forceps. This invasive procedure is conducted without anesthesia and relies on the visual identification of tissue softened through prior mechanical techniques. Following the removal of wet-to-dry dressings, nurses assess the wound bed for slough and softened necrosis before utilizing sterile instruments to excise visible debris as instructed. Although this combined approach can be implemented by hospital nurses, it necessitates a prior clinical assessment and direct authorization from the attending physician. This technique is known as Conservative Sharp Wound Debridement (CSWD), a method involving the removal of non-viable or infected tissue using sharp instruments with minimal pain or bleeding, thus bypassing the need for anesthesia (Wynn & Mayo, 2023). Recent literature suggests that CSWD effectively identifies infected tissue and accelerates granulation, provided it is performed by competent nurses under medical supervision (Nube et al., 2023; Schumer et al., 2020).

The interview results demonstrate a distinct division of authority between surgical and non-surgical debridement performed within the clinical setting. Participants reported that surgical debridement—particularly for extensive wounds—remains the exclusive responsibility of the surgeon or the attending physician. These high-level interventions are conducted in the operating theater under anesthesia utilizing sterile surgical instrumentation (Wynn & Mayo, 2023). Surgical debridement is a specialized procedure conducted by a surgeon using sterile instrumentation under anesthesia to ensure patient comfort and procedural efficacy. The process begins with a comprehensive cleansing and disinfection of the affected area, followed by a thorough exploration of the wound bed with specialized metal instruments (Melendez et al., 2025). This assessment is critical to determine wound depth and identify any retained foreign bodies prior to tissue excision. Other study also reveal that surgical debridement requires anesthesia and should only be performed by a surgeon, depending on the condition of the wound and the patient's needs (LeBlanc et al., 2024). The results of this study highlight participants' statements regarding authority in debridement practice. Participants stated that the authority has a direct impact on clinical decision-making and the application of safety principles. Because surgical procedures fall under the authority of surgeons, wound care that requires deep tissue excision or management of major bleeding tends to be referred to reduce complications. However, these limitations in professional authority necessitate collaboration; nurses serve as initial assessors and providers of follow-up care, while decisions to escalate treatment depend on consultation with physicians (Shi et al., 2025). This division of roles requires communication channels, operating procedures, and clear referral criteria. Furthermore, participants' feedback regarding collaborative practices

underscores the importance of interprofessional synergy within the wound care team (Sasaki et al., 2024). Conversely, participants reported that nurses primarily implement mechanical debridement using standard wet-to-dry techniques. Participants emphasized that nursing interventions are limited to daily wound management, whereas more extensive necrotomy or excision procedures remain the responsibility of the medical staff. The study results reveal heterogeneity in competence regarding debridement practices. Though some nurses rely on knowledge from formal education and clinical experience, others have completed wound certification training that provides them with a better understanding of advanced care. Conversely, those without specialized training reported a restricted knowledge base limited to basic principles. These findings highlight systemic gaps, including a deficient understanding of the medical versus non-medical debridement classification and limited access to modern dressings, both of which contribute to practice variations and potential safety risks.

The third theme identified in this study highlights the barriers nurses encounter when performing safe debridement. These obstacles are categorized into several key dimensions, including equipment and facility limitations, patient-related factors, the risk of hemorrhage or infection, and restricted clinical competence. Resource limitations—specifically in equipment and facilities—were the primary obstacles reported by most participants. Studies noted that equipment and facilities are key for optimal wound care in the hospitals (Kolimi et al., 2022; Deng et al., 2022). Nurses indicated that the lack of modern, advanced dressings hindered optimal wound healing, as these materials facilitate exudate management without requiring frequent changes. One study emphasized that an adequate supply of wound dressings is essential for achieving optimal healing outcomes (Nuutila & Eriksson, 2021). Due to these constraints, nurses often resorted to conventional methods utilizing sterile gauze and normal saline solution. Furthermore, several participants explained a limited inventory of sterile wound care sets, leading to treatment delays while awaiting the necessary re-sterilization processes. Therefore, both the government and hospitals must provide support by ensuring the availability of adequate wound care supplies within healthcare facilities (Beeckman et al., 2024). Another significant challenge was limited patient cooperation, particularly among pediatric patients with low pain thresholds. Participants noted that patients frequently refused debridement due to pain, procedural termination, and rescheduling. This resistance presented a unique challenge when managing individuals with high levels of procedural anxiety or sensitive psychological conditions. Therefore, nurses must possess excellent communication skills to effectively address the unique challenges within pediatric wound care (Costa & Serra, 2025; Brown et al., 2020).

Furthermore, nurses encounter challenges regarding bleeding risks, particularly in patients with extensive wounds, obscured necrotic tissue, or underlying coagulation disorders. Participants expressed substantial concern when excising necrotic tissue adhered to healthy tissue, as this can trigger bleeding. There were also heightened anxieties regarding the accidental damage of critical anatomical structures, such as tendons or major blood vessels. Patients with coagulation disorders, those on anticoagulant therapy, or individuals with chronic comorbidities face a heightened risk of hemorrhage during debridement (Rodriguez-Merchan, 2012; Simman et al., 2023). If bleeding is not addressed promptly, significant blood loss may occur, subsequently increasing the risk of secondary infection (Sharma et al., 2023; Han et al., 2023). Aggressive methods, such as CSWD or surgical debridement, carry a higher procedural risk than conservative approaches like autolytic or enzymatic debridement. Therefore, nurses must possess a thorough understanding of wound anatomy and conduct a comprehensive patient assessment before the procedure (Yu et al., 2025). Furthermore, managing hemorrhage risks is a significant concern in resource-limited settings where access to hemostatic agents or specialized pressure bandages may be restricted. The risk of infection emerged as a predominant obstacle. Participants noted that the use of non-sterile equipment, suboptimal adherence to aseptic principles, and unhygienic patient environments elevate the risk of wound infection. Furthermore, poor personal hygiene exacerbates wound conditions and impedes the healing process (Mrdjenovich & Fleck, 2011). Participants' emotional accounts during the interviews highlighted deep concerns regarding the lack of hygiene awareness among patients and their caregivers. Infections occurring during or after debridement can lead to serious complications and delay the healing process (Celik et al., 2024). These infections often originate from non-sterile instruments, unhygienic environments, or pre-existing biofilms within the wound bed—risks that are further exacerbated in patients with diabetes or chronic systemic diseases.

Studies show that the use of modern dressings is very helpful in optimizing wound healing, such as hydrogel, calcium alginate, and foam dressings (Nguyen et al., 2023; Brumberg et al., 2021). In addition to accelerating healing, these dressings also improve patient comfort and reduce the frequency of dressing changes (Tran et al., 2023). Until now, the implementation of debridement by nurses at the bedside has adhered to general hospital procedures. Consequently, this lack of specific guidance caused confusion among nursing staff, forcing them to rely solely on personal experience. Furthermore, formal wound care training emerged as a dominant expectation among participants. This training was considered crucial for enhancing skills and theoretical understanding in identifying wound care. Also, continuous

education helps nurses stay current with the latest evidence-based methods and improve care. Training programs such as WOCN (Wound, Ostomy, and Continence Nurse) or enterostomal therapy training have been proven to build professional competence in wound care practice. With consistent training, all ward nurses are expected to perform debridement safely and effectively for patients.

Conclusion

The findings have important implications for clinical practice, particularly in improving the quality of wound care in hospitals. Hospitals need to support wound care by providing adequate equipment, establishing evidence-based procedures, and strengthening the competence of nursing staff. Additionally, service management that supports team collaboration during debridement procedures is required in the hospitals. The government acts as a primary regulator by defining the legal scope of practice and accreditation standards that authorize nurses to perform specialized debridement methods within hospital settings. Furthermore, governmental health policies dictate the allocation of resources and the integration of wound care into universal coverage agendas that directly shape the clinical environment and the holistic resources available to practitioners. Further research is recommended to evaluate the effectiveness of various debridement techniques, specifically to measure their impact on wound healing outcomes and nursing workloads.

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AI statements

The authors confirm that no generative AI tools were used for idea development or research data analysis during the preparation of this manuscript.

Author's declaration

All authors have made substantial contributions to complete the research and manuscript for publication.

Availability of data and materials

All data and materials supporting the findings of this study are available from the corresponding author upon reasonable request for academic purposes.

Competing interests

The authors declare that they have no conflicts of interest.

Ethical clearance

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Publishers and journal's note

This research explains the essential role of debridement in wound management. Its significance lies in examining how nurses implement these techniques despite the systemic challenges in hospitals. Furthermore, the qualitative approach used is perfectly suited for investigating the lived experiences of these practitioners. The Editor noted that research of this nature must be continuously pursued to drive improvements in wound care, particularly within hospital settings. Such evidence-based insights are essential for advocating for the systemic allocation of modern dressing technologies and specialized training resources.

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Authors' insight

Key points

- The study explores how nurses integrate physiological, psychological, and patient-centered factors when selecting and performing debridement methods.
- The research prioritizes the subjective perspectives and clinical realities of hospital nurses that revealing the "essence" of what it means to manage complex wounds in a high-pressure environment.
- The study aims to uncover the alignment between evidence-based debridement protocols and the actual methods used by nurses in daily hospital practice.

Emerging nursing avenues

- How do hospital nurses balance their professional autonomy in choosing debridement methods with strict institutional policies and surgeon-led wound care protocols?
- What specific barriers prevent nurses from applying a truly holistic approach (e.g., pain management, nutrition, and patient education) during the technical debridement process?
- How has the introduction of advanced debridement technologies in 2026 influenced nurses' perceptions of traditional mechanical or sharp debridement methods?

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