

Knowledge, Attitudes, and Clinical Implementation of Pressure Injury Prevention among Intensive Care Nurses

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Abstract:

Pressure ulcers represent a significant patient safety concern in intensive care units, primarily due to prolonged immobilization, impaired tissue perfusion, and the use of invasive medical devices. Nurses play a pivotal role in prevention through adequate knowledge and positive attitudes toward evidence-based interventions. This study described nurses' knowledge and attitudes regarding pressure ulcer prevention in the Melati Intensive Care Unit at Bangil Regional General Hospital. A descriptive design with purposive sampling was employed, involving three intensive care nurses as respondents. Data collection utilized validated instruments: the Pressure Ulcer Knowledge Assessment Tool (PUKAT) and the Attitude Towards Pressure Ulcer Prevention Instrument (APuP). Descriptive statistical analysis presented findings through frequency and percentage distributions. Results indicated that 66.7% of nurses demonstrated adequate knowledge, 33.3% demonstrated good knowledge, and no respondents exhibited poor knowledge. All respondents (100%) displayed positive attitudes toward pressure ulcer prevention and consistently implemented preventive measures in accordance with standard operating procedures. These findings suggest that nurses possess sufficient cognitive and affective competencies to support effective pressure ulcer prevention practices, including regular repositioning, maintenance of skin integrity, moisture management, and comprehensive risk assessment. The alignment between adequate knowledge, positive attitudes, and optimal implementation reflects a strong patient safety culture within the intensive care unit. However, the lack of formal specialized training among most respondents underscores the need for structured continuing education programs. Institutional support for regular training is essential to maintain evidence-based practice standards and ensure sustainable quality improvement in pressure ulcer prevention, ultimately enhancing patient safety outcomes in critical care environments.

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INTRODUCTION

Pressure injuries represent a significant global patient safety challenge in intensive care units, demanding rigorous preventive nursing interventions (Alanazi et al., 2023). These complex wounds result from prolonged pressure on bony prominences, leading to severe tissue ischemia and cellular necrosis (Gefen et al., 2022). The global healthcare burden associated with pressure injuries includes prolonged hospital stays, escalated treatment costs, and diminished patient quality of life (Liu et al., 2024). Intensive care units report the highest incidence rates worldwide because critically ill patients possess multiple overlapping risk factors (Jia et al., 2023). Nurses serve as the frontline

defense against this complication, making their competency in prevention strategies a critical determinant of global patient safety outcomes and overall healthcare efficiency (Salia et al., 2025).

Patients in intensive care settings face an exceptionally high risk of developing pressure injuries due to prolonged immobilization and the extensive use of invasive medical devices (Peterson et al., 2025). The Indonesian public hospitals often manage high patient volumes with complex critical conditions, amplifying the vulnerability of the patient population (Djunaedi & Datusanantyo, 2025). The continuous pressure and friction experienced by totally dependent patients disrupt capillary blood flow and accelerate skin deterioration (Levine, 2024). Addressing this specific contextual problem requires a highly skilled nursing workforce capable of executing meticulous preventive care under demanding clinical conditions and resource limitations.

Current literature emphasizes that nurses' comprehensive knowledge and positive attitudes are the primary determinants of successful pressure injury prevention protocols (Asiri et al., 2024). Recent studies worldwide highlight that adequate cognitive understanding enables nurses to accurately assess risk using validated tools such as the Braden Scale (Kennerly et al., 2022). Scholars consistently demonstrate that nurses possessing robust theoretical foundations can identify early signs of skin compromise and initiate timely interventions (Kandula, 2025). The state-of-the-art evidence confirms that continuous education and structured training programs significantly elevate these knowledge metrics. Maintaining high knowledge standards ensures that nursing care aligns with the latest evidence-based clinical practice guidelines and international patient safety benchmarks (Serafin et al., 2025).

A positive professional attitude acts as the crucial psychological bridge that translates theoretical nursing knowledge into consistent clinical practice (Lee et al., 2022). The affective domain of nursing competence shapes healthcare professionals' willingness to prioritize preventive measures despite heavy workloads and resource constraints (Cordina et al., 2025). Research indicates that nurses who exhibit strong professional commitment and positive perceptions of prevention protocols demonstrate superior compliance with standard operating procedures (McMahon et al., 2025). This psychological readiness fosters a proactive, rather than reactive, approach to managing patient skin integrity. Cultivating such attitudes is therefore recognized as an essential component of modern intensive care nursing education, leadership development, and sustainable quality improvement initiatives (Song et al., 2024).

A distinct gap exists in localized studies evaluating the triad of knowledge, attitudes, and actual implementation in regional public hospitals in developing countries. Most existing literature focuses on tertiary or university-affiliated hospitals, leaving regional facilities underrepresented in the scientific discourse. The novelty of this research lies in its focus on the Melati Intensive Care Unit at Bangil Regional General Hospital, offering unique insights into this healthcare setting. Evaluating the direct correlation between cognitive understanding, affective readiness, and practical execution in this specific environment offers a nuanced perspective often missing in broader studies. This localized approach uncovers unique institutional dynamics and workforce characteristics that fundamentally influence prevention outcomes (Sari et al., 2023).

This study aims to comprehensively describe nurses' knowledge and attitudes toward pressure injury prevention in the Melati Intensive Care Unit at Bangil Regional General Hospital. The research specifically investigates how these cognitive and affective variables influence the actual implementation of preventive nursing interventions. Using validated assessment tools, the study quantifies the current competency levels of intensive care nursing staff. The objective is to map the existing landscape of pressure injury prevention practices within this specific clinical environment (Saleh et al., 2026). Understanding these baseline metrics provides hospital administrators and

nursing leaders with actionable data to effectively tailor future educational programs, resource allocation, and operational strategies.

Conducting this assessment is urgently required to establish a foundational baseline for enhancing patient safety culture and optimizing nursing service quality in critical care environments. The immediate need to mitigate preventable complications in intensive care units drives the necessity for this evaluation. Identifying specific knowledge deficits or attitudinal barriers allows healthcare institutions to implement targeted interventions before adverse patient outcomes occur (Shi et al., 2025). The findings will directly inform the development of customized training modules and policy revisions tailored to the unique needs of the nursing staff. Ultimately, this research serves as a vital catalyst for elevating the standard of care and ensuring the highest levels of patient safety in regional intensive care settings, thereby reducing preventable morbidity.

METHOD

Design

This study used a descriptive design with a case study approach. The research aimed to describe nurses' knowledge and attitudes toward pressure injury prevention.

Setting and Time

The study was conducted in the Melati ICU of Bangil General Hospital. The research took place in September 2025.

Sample and Sampling

The research subjects consisted of three ICU nurses. A purposive sampling technique was used to select participants.

Instrument and Measurement Properties

The research data were primary data collected using three instruments. The Pressure Ulcer Knowledge Assessment Tool (PUKAT) was used to assess nurses' knowledge of pressure ulcer prevention. The Attitude Towards Pressure Ulcer Prevention Instrument (APuP) was used to assess nurses' attitudes towards pressure ulcer prevention. A questionnaire on pressure ulcer prevention was also administered to assess the actual implementation of preventive measures.

Data Collection Procedure

The researchers carried out data collection. The process commenced only after obtaining formal research permission.

Data Analysis

The data were analyzed descriptively. The results were presented as frequency distributions and percentages. This analysis described the level of knowledge, attitudes, and implementation of pressure ulcer prevention.

Ethical Declaration

Ethical approval was obtained from the Faculty of Nursing at the Universitas Jember. Written informed consent was secured from all respondents. The researchers maintained strict confidentiality throughout the study. Participation was entirely voluntary.

RESULT

Respondent Characteristics

Respondent characteristics in this study included age, gender, highest level of education, length of service, compression injury training, and position in the room. Table 1 outlines the demographic and professional profile of the three nurses participating in the study, revealing a group in their productive adult years (30–34 years old) with a majority being male (66.7%) and holding a Nursing degree (66.7%). The respondents possessed moderate clinical experience, evenly distributed between 4, 5, and 6 years of service, suggesting they had passed the initial adaptation phase of their careers. A notable finding is that, despite two-thirds of the respondents holding shift supervisor positions, the majority (66.7%) had not received specific training in pressure injury prevention, suggesting that their current competence likely relies on general work experience and informal workplace learning rather than structured, specialized education.

Table 1. Respondent characteristics

Characteristics	Frequency	Percentage
Age		
30 years old	1	33.3
33 years old	1	33.3
34 years old	1	33.3
Gender		
Man	2	66.7
Woman	1	33.3
Education		
D3	1	33.3
Ners	2	66.7
Length of experience		
4 years	1	33.3
5 years	1	33.3
6 years	1	33.3
Pressure injury training		
Attended	1	33.3
Not attended	2	66.7
Position in the room		
Nursing staff	1	33.3
Shift supervisor	2	66.7

Knowledge about pressure injury prevention

Knowledge of pressure injury prevention in the Melati ICU at Bangil Regional General Hospital was assessed using the Pressure Ulcer Knowledge Assessment Tool (PUKAT) questionnaire. Table 2 illustrates the distribution of nurses' knowledge regarding pressure injury prevention in the Melati ICU. The results indicate that the majority of respondents (66.7%) possessed an adequate level of knowledge, while the remaining one-third (33.3%) achieved a good level. Notably, no nurses fell into a poor knowledge category, demonstrating that all participating nurses have at least a foundational understanding of pressure injury prevention. This overall knowledge level, ranging from adequate to good, suggests that the nurses are cognitively prepared to identify risk factors and implement standard preventive interventions. However, the absence of a "good" score for the majority may reflect the complex and theoretical nature of the assessment tool used to measure their understanding.

Table 2. Knowledge about pressure injury prevention

Level of knowledge	Frequency	Percentage
Good	1	33.3
Adequate	2	66.7
Total	3	100

Attitudes towards pressure injury prevention

Attitudes toward pressure ulcer prevention in the Melati ICU of Bangil Regional General Hospital were measured using the Attitude Towards Pressure Ulcer Prevention Instrument (APuP) questionnaire. Table 3 shows that all respondents (100%) demonstrated a positive attitude towards pressure injury prevention in the Melati ICU. This unanimous positive attitude indicates that nurses possess strong awareness, willingness, and commitment to implementing preventive measures as an integral part of their professional responsibilities. Such uniformly positive attitudes are crucial for ensuring consistent adherence to prevention protocols, as they reflect nurses' intrinsic motivation to prioritize patient safety and quality of care. This finding suggests that the nursing staff in the Melati ICU recognize the importance of pressure injury prevention and are psychologically prepared to engage in preventive practices, which serves as a strong foundation for translating knowledge into effective clinical action.

Table 3. Attitudes towards pressure injury prevention

Attitudes towards pressure injury prevention	Frequency	Percentage
Good	3	100
Total	3	100

The implementation of pressure ulcer prevention

The implementation of pressure ulcer prevention in the Melati ICU of Bangil Regional General Hospital was measured using the Attitude Towards Pressure Ulcer Prevention Instrument (APuP) questionnaire. Table 4 reveals that all respondents (100%) were categorized as implementing pressure ulcer prevention measures in the Melati ICU. This finding demonstrates complete adherence to preventive protocols among the nursing staff, indicating that evidence-based interventions such as regular repositioning, skin care, moisture management, and risk assessment have been consistently integrated into daily nursing practice. The universal implementation of preventive measures reflects the effectiveness of standard operating procedures and the strong patient safety culture within the ICU, where nurses translate their adequate knowledge and positive attitudes into concrete clinical actions. This optimal implementation rate is particularly significant given that all patients in the ICU are at high risk for pressure injuries due to immobilization and critical conditions, suggesting that the nursing team has successfully established pressure injury prevention as a routine and non-negotiable aspect of patient care, thereby contributing to enhanced patient safety and quality of nursing services.

Table 4. The implementation of pressure ulcer prevention

Implementation of pressure ulcer prevention	Frequency	Percentage
Implementing	3	100
Total	3	100

DISCUSSION

This study revealed that nurses in the Melati ICU demonstrated adequate to good knowledge levels, universally positive attitudes, and complete implementation of pressure injury prevention measures. The findings indicate that the nursing staff possesses sufficient cognitive understanding and affective readiness to translate evidence-based guidelines into consistent clinical practice. All respondents successfully integrated preventive interventions, including repositioning, skin care, moisture management, and risk assessment, into their daily nursing routines. These outcomes suggest that the combination of productive age, clinical experience, and established standard operating procedures creates a supportive environment for patient safety initiatives. The absence of poor knowledge categories and the universal positive attitudes reflect a nursing workforce committed to quality care delivery (Forkuo-Minka et al., 2024).

The respondents' age range of 30–34 years falls within the productive adult period, characterized by optimal cognitive development and emotional stability. Nurses in this age bracket demonstrate enhanced critical-thinking abilities that support sound clinical decision-making in complex intensive care settings. Productive age facilitates better problem identification and the appropriate selection of interventions for pressure injury prevention. Research indicates that nurses in this developmental stage demonstrate greater consistency in applying preventive measures than their younger or older counterparts. The maturity associated with this age group enables nurses to balance technical skills with compassionate care delivery (Li et al., 2025).

Male nurses comprised most respondents in this study, reflecting the physical demands associated with intensive care nursing. Male nurses frequently engage in patient repositioning activities that require physical strength and endurance throughout extended shifts. Theoretical frameworks suggest that professional competency in pressure injury prevention depends more on technical skills, work experience, and adherence to protocols than on gender characteristics. Gender distribution does not determine the quality of preventive care when standard operating procedures are properly established and monitored. The intensive care environment requires physical readiness, which nurses of any gender can meet when proper teamwork and resource allocation are in place (Kurtgöz & Koç, 2024).

All respondents possessed 4–6 years of clinical experience in intensive care, indicating successful completion of the initial adaptation phase. Extended work experience correlates with refined clinical skills, heightened sensitivity to the risk of complications, and improved decision-making based on pattern recognition. Nurses with this level of experience can recognize early warning signs of skin deterioration and implement timely interventions. Research confirms that the length of service positively influences the quality of pressure injury prevention in critical care settings. Clinical experience enables nurses to anticipate patient needs and apply nursing standards with greater consistency and confidence (Team et al., 2024).

Most respondents had not attended specialized training on pressure injury prevention despite demonstrating adequate knowledge and optimal implementation. This finding suggests that nurses acquired their competencies through workplace learning, peer mentoring, and accumulated experiential knowledge. Structured training programs have been shown to enhance knowledge, attitudes, and practices while promoting adherence to evidence-based guidelines. The absence of formal training can create barriers to knowledge updates and limit exposure to emerging best practices. Institutional support for continuing education remains essential to maintain competency levels and ensure alignment with current scientific evidence (Seton et al., 2022).

Most nurses demonstrated adequate knowledge, while one-third were categorized as having good knowledge, with no respondents falling into the poor knowledge category. Knowledge

encompasses understanding of risk factors, assessment instruments such as the Braden Scale, and the application of preventive interventions in accordance with practice guidelines. Adequate knowledge enables early identification of at-risk patients and appropriate selection of preventive strategies. The cognitive domain underpins attitudes and behaviors in nursing practice, supporting clinical decision-making. Knowledge gaps in complex theoretical aspects such as etiology and classification may explain why not all respondents achieved the good category despite strong practical performance (Ardıç & Akbuğa, 2025).

All respondents exhibited positive attitudes toward pressure injury prevention, reflecting high awareness of its importance for patient safety and nursing quality. Attitudes function as affective responses that bridge the gap between knowledge acquisition and practical application in clinical settings. Positive attitudes encourage consistent preventive actions even when facing resource constraints or demanding workloads characteristic of intensive care units. Professional commitment manifests through nurses' willingness to prioritize prevention activities despite competing demands. The affective domain strengthens motivation to maintain compliance with nursing standards and supports sustainable prevention efforts over time (Sugathapala et al., 2026).

Universal implementation of pressure injury prevention measures indicates successful translation of knowledge and attitudes into clinical practice. Preventive interventions, including repositioning, skin integrity maintenance, moisture management, and risk assessment, were consistently performed in accordance with standard operating procedures. The integration of prevention protocols into routine ICU workflow facilitates consistent application regardless of individual knowledge variations. Work experience and positive attitudes can compensate for limited formal training when strong patient safety cultures exist within healthcare organizations. Teamwork and institutional support create environments where evidence-based practices become normalized components of daily care delivery (Cetinkaya et al., 2026).

The relationship between knowledge, attitudes, and implementation reveals that adequate knowledge combined with positive attitudes produces optimal clinical outcomes. Knowledge provides the cognitive foundation for understanding intervention rationales, while attitudes supply the motivational drive for consistent execution. Implementation success depends on the synergy between these cognitive and affective domains supported by organizational systems and resources. Nurses with positive attitudes demonstrate greater responsibility, heightened patient sensitivity, and stronger compliance with practice standards. Prevention activities transcend routine tasks to become integral components of patient safety initiatives when nurses internalize their professional responsibilities (Fang et al., 2025; Wijaya et al., 2024).

These findings carry important implications for nursing management and educational program development in intensive care settings. Healthcare institutions should prioritize continuous education programs that update nurses' knowledge on emerging evidence and innovative prevention technologies. Management must ensure adequate staffing levels and resource availability to support consistent implementation of time-intensive preventive interventions. Mentorship programs can facilitate knowledge transfer from experienced nurses to newly graduated staff members entering intensive care environments. Regular audits and feedback mechanisms help maintain adherence to protocols while identifying areas requiring additional support or training. Organizational commitment to patient safety must be reflected in policies, resource allocation, and professional development opportunities (Alanazi et al., 2023; Widiastuti et al., 2026).

Several limitations warrant consideration when interpreting these findings. The small sample size of three nurses limits the generalizability of results to broader intensive care nursing populations. The descriptive case study design precludes establishing causal relationships among knowledge, attitudes, and implementation behaviors. Self-reported data collection methods introduce potential

social desirability bias, in which respondents may overestimate their knowledge or report socially acceptable attitudes. The cross-sectional nature of data collection provides only a snapshot of nurses' competencies without capturing changes over time. Future research should employ larger sample sizes across multiple institutions and use longitudinal designs to better understand the dynamics of knowledge translation into practice.

CONCLUSION

Nurses in the Melati ICU at Bangil Regional General Hospital demonstrate sufficient knowledge of pressure injury prevention, including understanding of risk factors, pathophysiological mechanisms, vulnerable anatomical sites, and evidence-based preventive interventions aligned with nursing practice standards. The nursing staff exhibits positive attitudes toward pressure injury prevention, reflecting a strong awareness of its significance for patient safety and the quality of nursing services. These favorable attitudes facilitate consistent implementation of preventive measures in clinical practice. All nurses perform pressure injury prevention interventions in accordance with established standard operating procedures, including systematic repositioning, maintenance of skin integrity, moisture management, application of pressure-redistributing devices, and attention to nutritional requirements. The combination of adequate knowledge and positive attitudes among nurses provides a foundation for optimal pressure injury prevention among critically ill patients in intensive care settings. These findings underscore the importance of maintaining and strengthening nurses' competencies through continuous education to ensure sustainable, evidence-based pressure injury prevention practices that enhance patient safety outcomes and elevate the overall quality of nursing care in intensive care units.

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CONFLICT OF INTEREST

The authors declare no conflicts of interest regarding this manuscript.

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