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Knowledge of Nurses on Pressure Ulcer Staging, Prevention, and Wound Characteristics at Quirino Memorial Medical Center

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Abstract. Pressure ulcers remain a significant patient safety concern globally, contributing to morbidity, extended hospitalization, and increased healthcare costs. Nurses play a critical role in preventing, assessing, and managing pressure ulcers; however, knowledge gaps persist, particularly in staging, prevention strategies, and wound assessment. This study aimed to evaluate the knowledge levels of nurses at Quirino Memorial Medical Center (QMMC) regarding pressure ulcer staging, prevention, and wound characteristics. A descriptive quantitative research design was employed, involving 283 registered nurses selected through stratified random sampling. Data were collected using the validated 47-item Pieper Pressure Ulcer Knowledge Test (PPURKT), covering three domains: staging (9 items), prevention strategies (30 items), and wound characteristics (8 items). Descriptive statistics, including mean percentage scores and competency classifications, were calculated to assess knowledge levels. Results revealed that nurses demonstrated moderate knowledge in prevention strategies (73.54%) and pressure ulcer staging (73.31%), indicating a solid understanding of fundamental prevention measures and ulcer classification. Conversely, knowledge in wound characteristics was low (53.93%), highlighting difficulties in identifying tissue types, interpreting exudate, and understanding advanced wound assessment techniques. Item-level analysis further identified misconceptions related to heel protectors, donut/ring cushions, massaging bony prominences, and eschar interpretation. Strengths were observed in risk assessment, Braden Scale documentation, and recognition of advanced-stage pressure ulcers. These findings underscore the necessity for targeted educational interventions, competency-based training, and regular knowledge assessments to bridge identified gaps. Strengthening nurses' knowledge in wound characteristics and advanced prevention strategies can enhance patient outcomes, reduce the incidence of pressure ulcers, and improve adherence to evidence-based protocols in clinical settings. Future research should explore the correlation between knowledge, attitudes, and clinical practices, as well as institutional factors influencing the consistent implementation of preventive measures.

Keywords: Pressure ulcers, nursing knowledge, Pieper Pressure Ulcer Knowledge Test, staging, prevention

Introduction

Pressure ulcers, also known as pressure injuries or bedsores, are among the most persistent and preventable patient safety problems worldwide. They are localized injuries to the skin and underlying tissues, usually over bony prominences, caused by sustained pressure, shear, or friction. Beyond the physical burden of pain, immobility, and infection, pressure ulcers also represent a serious economic challenge for healthcare systems. According to Li et al. (2020), the global pooled prevalence of pressure ulcers among hospitalized adults is 12.8%, while Zhang et al. (2025) reported that the total number of cases nearly doubled from 300,000 in 1990 to 646,000 in 2021, underscoring the growing burden in an aging population. In intensive care settings, where patients are most vulnerable, incidence rates can reach as high as 16%, as shown in a meta-analysis by Isfahani et al. (2024).

Despite these alarming figures, research demonstrates that pressure ulcers are largely preventable. Studies suggest that up to 95% of pressure ulcers could be avoided with proper evidence-based nursing care (Wu et al., 2022). However, gaps in knowledge remain a pressing issue. A meta-analysis by Wu et al. (2022) revealed that nurses worldwide scored an average of only weaknesses particularly in staging, classification, and prevention techniques. Furthermore, a systematic review by Asiri et al. (2025) emphasized that knowledge, attitudes, and practices (KAP) toward pressure ulcer prevention are not always aligned, as practice is often influenced by factors such as staffing levels, resources, and institutional policies.

In the Philippine context, studies are fewer but highlight similar concerns. Molon et al. (2011) reported a 20% incidence of pressure ulcers among orthopedic inpatients at a Manila tertiary hospital. More recently, at Quirino Memorial Medical Center (QMMC), a 2020–2021 retrospective study revealed a 1.4% incidence of hospital-acquired pressure injuries among older patients, with most cases classified as Stage 1 or 2. While this appears low, it reflects possible underreporting and lack of standardized policies, as emphasized by Barit et al. (2021). This suggests that while Filipino nurses are aware of preventive strategies, challenges remain in consistent application due to systemic barriers such as high patient load, limited access to equipment, and insufficient institutional protocols.

Given these findings, it becomes necessary to assess the knowledge and competency of nurses at QMMC in preventing, staging, and classifying pressure ulcers. Understanding their knowledge levels is critical in designing targeted training programs, strengthening hospital protocols, and ultimately improving patient outcomes.

Research Questions

This study aims to determine the percentage of correct responses from the total number of nurse participants at Quirino Memorial Medical Center in the areas of pressure ulcer staging, prevention strategies, and wound characteristics, as measured by Pieper's Pressure Ulcer Knowledge Test (PPURKT).

Specifically, the study aimed to address the questions;

1. What is the demographic profile of nurse respondents in terms of:
 - 1.1 Gender,
 - 1.2 Length of service, and
 - 1.3 Area of assignment?
2. What is the percentage of correct responses on pressure ulcer staging as measured by PPURKT?
3. What is the percentage of correct responses on pressure ulcer prevention strategies as measured by PPURKT?
4. What is the percentage of correct responses on wound characteristics as measured by PPURKT?

Scope and Delimitation of the Study

The Study research focuses exclusively on nurses working at Quirino Memorial Medical Center. It assesses their knowledge related to pressure ulcer staging, prevention strategies, and wound characteristics. Factors such as nurses' attitudes, personal experiences, or direct clinical performance are beyond the scope of this study.

Literature Review

Pressure ulcers remain a significant global health concern, affecting millions of patients and placing substantial strain on healthcare systems. A systematic review by Li et al. (2020) reported a pooled global prevalence of 12.8% among hospitalized adults, highlighting the widespread nature of the problem. This burden has increased over time; the Global Burden of Disease (GBD) 2021 analysis by Zhang et al. (2025) estimated that cases nearly doubled from approximately 300,000 in 1990 to 646,000 in 2021, with higher mortality among older populations. In critical care settings, the risk is even more pronounced, with Isfahani et al. (2024) documenting a 16% pooled incidence of hospital-acquired pressure injuries in intensive care units (ICUs) in the Eastern Mediterranean region. These findings confirm that pressure ulcers remain both prevalent and consequential in terms of patient outcomes and healthcare resource utilization.

Several studies have identified key risk factors associated with pressure ulcer development. Bahramnezhad et al. (2024) found that advanced age, low body weight, and vasopressor use significantly increased the likelihood of ICU patients developing pressure ulcers. Preventive interventions such as regular repositioning and the use of pressure-relieving mattresses were shown to reduce this risk. Similarly, Chung et al. (2023), in a meta-analysis of 28 studies, reported that low Braden Scale scores and advanced age consistently predicted higher risk of ulcer development. These findings support the reliability of the Braden Scale as an effective tool for early risk identification across diverse patient populations and clinical settings.

The role of nurses is central to the prevention of pressure ulcers; however, global evidence highlights persistent gaps in knowledge and practice. Wu et al. (2022) reported that nurses achieved an average score of only 51.5% on the Pressure Ulcer Knowledge Assessment Tool (PUKAT), with deficiencies particularly in ulcer staging and preventive strategies. Similarly, Asiri et al. (2025) found that although nurses generally demonstrate positive attitudes toward prevention, their practices are often constrained by contextual factors

such as heavy workloads, staffing shortages, and limited resources. These findings suggest that improving knowledge alone is insufficient and must be accompanied by supportive institutional conditions to ensure effective implementation.

Evidence-based strategies for pressure ulcer prevention are well established. Priya et al. (2024) demonstrated that a nurse-led quality improvement program in an ICU reduced incidence from 50% to zero within three months by reinforcing turning schedules, routine skin assessments, and staff education. International guidelines, such as those from the National Pressure Injury Advisory Panel (NPIAP) and European Pressure Ulcer Advisory Panel (EPUAP) (2019), emphasize similar preventive measures, including risk assessment, repositioning, and the use of pressure-relieving support surfaces. Despite this, implementation remains inconsistent, particularly in resource-limited settings, limiting the effectiveness of these interventions.

In the Philippine context, research on pressure ulcer incidence and prevention remains limited but informative. Molon et al. (2011) reported a 20% incidence among orthopedic patients in a tertiary hospital in Manila, highlighting the vulnerability of immobilized individuals. A retrospective study at Quirino Memorial Medical Center (2020–2021) reported a 1.4% incidence of hospital-acquired pressure injuries among older adults, though Barit et al. (2021) suggested this may reflect underreporting due to the lack of standardized policies and reporting systems. Furthermore, Panondi and Natividad (2023) found that while nurses demonstrated adequate knowledge, systemic barriers—such as high workloads, insufficient staffing, and lack of equipment—hindered consistent implementation of preventive practices. These gaps indicate the need for more localized research, particularly studies examining how demographic factors such as area of assignment and length of service influence specific domains of knowledge, including staging and prevention, to inform targeted and context-appropriate interventions.

Methodology

Research Design

This study employed a descriptive quantitative research design. The descriptive approach is appropriate because it aims to systematically measure and describe the knowledge levels of nurses regarding pressure ulcer staging, prevention, and wound characteristics, without manipulating variables. The quantitative method allows for statistical analysis of responses to identify knowledge gaps.

Sampling Design

A random sampling method was used to select participants from different departments at QMMC. Using Slovin's formula, a total sample of 283 nurses will be included to achieve a 95% confidence level with a $\pm 5\%$ margin of error, ensuring the generalizability and accuracy of the findings.

Research Participants

This study included registered nurses employed at Quirino Memorial Medical Center (QMMC) who were directly assigned to bedside care (Nurse 1, Nurse 2, and Nurse 3). These respondents had firsthand responsibility in implementing pressure ulcer prevention strategies in clinical settings. To be included in the study, participants had to be registered nurses currently assigned to clinical units such as medical-surgical wards, intensive care units, or specialty wards, with at least one month of work experience, and willing to participate by providing informed consent. Nurses assigned to administrative or non-clinical roles, including nurse managers and supervisors without direct bedside responsibilities, were excluded. Additionally, nurses who were on leave during the data collection period and those assigned to outpatient departments (OPD), obstetrics-gynecology, and pediatric wards were not included in the study.

Research Instrument

The study utilized Pieper's Pressure Ulcer Knowledge Test (PPURKT), a validated 47-item questionnaire designed to assess nurses' knowledge of pressure ulcer management. The instrument consisted of three domains: staging of pressure ulcers (9 items), prevention strategies (30 items), and wound characteristics (8 items). The questionnaire employed a dichotomous response format of Strongly Agree and Strongly Disagree. Each correct response was assigned a score of 1, while incorrect or unanswered items were scored 0. The total score was computed by summing all correct responses to determine the overall level of knowledge. Knowledge levels were categorized as high ($\geq 80\%$ correct responses), moderate (60–79% correct responses), and low ($< 60\%$ correct responses).

Data Gathering Procedure

Data was collected through the distribution of questionnaires, thru electronically specifically Google form, based on participant convenience. Participants will have adequate time to complete the questionnaires. Regular follow-up reminders will be provided to ensure maximum response rates and timely completion.

Results and Discussions

Problem 1: What is the demographic profile of the nurse respondents in terms of gender, length of service, and area of assignment?

Table 1: The demographic profile of the nurse respondents in terms of gender, length of service, and area of assignment

Demographic Factor	Category	Frequency (f)	Percentage (%)
Gender	Female	172	60.8 %
	Male	111	39.2 %
Length Of Service	0-1 years	72	25.4 %
	1-3 years	90	31.8 %
	3-5 years	43	15.2 %
	5 years and above	78	27.6 %
Area Of Assignment	Medical wards	128	45.2 %
	Surgical wards	36	12.7 %
	Intensive Care Unit (ICU)	57	20.2 %
	Specialty/Others	62	21.9 %

Table 1 shows the demographic characteristics of the 283 nurse respondents in terms of gender, length of service, and area of assignment. The majority of respondents were female (60.8%), while males comprised 39.2%, reflecting the traditionally female-dominated nursing workforce but also indicating growing gender diversity. Regarding length of service, the largest group had 1–3 years of experience (31.8%), followed by those with 5 years and above (27.6%), nurses with 0–1 year of experience (25.4%), and those with 3–5 years (15.2%), suggesting a balanced mix of novice and experienced practitioners that can support mentorship and skill-sharing. In terms of area of assignment, most respondents were from Medical Wards (45.2%), followed by Specialty and Other units (21.9%), ICU (20.2%), and Surgical Wards (12.7%), indicating that a significant proportion work in high-risk environments for pressure ulcer development. This distribution provides context for interpreting their knowledge and practice in pressure ulcer staging, prevention, and wound management, as demographic factors such as experience level and clinical assignment are known to influence competency in evidence-based nursing care (Chung et al., 2023; Wu et al., 2022; Bahramnezhad et al., 2024).

Problem 2: What is the percentage of correct responses on pressure ulcer staging as measured by PPURKT?

Table 2: Mean Percentage of Correct Responses by Knowledge Domain

Knowledge Domain	Number of Items	Mean Percentage Correct (%)	Competency Classification
Prevention Strategies	30	73.54 %	Moderate Knowledge
Staging of Pressure Ulcers	9	73.31 %	Moderate Knowledge
Wound Characteristics	8	53.93 %	Low Knowledge

Table 2 shows the results of the Pieper Pressure Ulcer Knowledge Test (PPURKT), illustrating the nurses' knowledge across three domains of pressure ulcer care: Prevention Strategies, Staging, and Wound Characteristics. Nurses demonstrated moderate knowledge in Prevention Strategies (73.54%) and Pressure Ulcer Staging (73.31%), indicating that they understood basic preventive measures such as patient repositioning, routine skin assessments, and identifying pressure injuries from Stage I to Stage IV, but still fell short of the high knowledge threshold ($\geq 80\%$), suggesting a need for additional training and practical

reinforcement. In contrast, the Wound Characteristics domain scored much lower at 53.93%, reflecting low knowledge and highlighting difficulties in identifying complex wound features, including slough, eschar, tunneling, granulation tissue, and different types of exudates. These findings suggest that while nurses possess foundational knowledge in prevention and staging, they require targeted education, workshops, simulations, and hands-on practice to improve competency in advanced wound assessment, which is essential for accurate evaluation, appropriate intervention, and effective prevention of pressure ulcers in high-risk patients.

Problem 3: What is the percentage of correct responses on pressure ulcer prevention strategies as measured by PPURKT?

Table 3: Item-Level Analysis of Critical Knowledge Gaps (Lowest Scoring Items)

Question No.	Question Description (Excerpt)	Correct Response	Percentage Correct (%)	Domain
Q13	Heel protectors relieve pressure on the heels	False	13.8%	Prevention
Q14	Donut/ring cushions prevent pressure ulcers	False	14.1%	Prevention
Q18	Weight should be shifted every 30 minutes when sitting in a chair	True	20.8%	Prevention
Q5	It is important to massage bony prominences	False	28.6%	Wound Characteristics
Q27	Eschar is good for wound healing	False	30.7%	Wound Characteristics

Table 3 shows the item-level results of the Pieper Pressure Ulcer Knowledge Test (PPURKT), highlighting critical knowledge gaps in the Prevention and Wound Characteristics domains. These results demonstrate that, although nurses achieved moderate overall knowledge scores, specific misunderstandings persist that may compromise patient safety and clinical outcomes. In the Prevention domain, low scores were observed in items related to the use of heel protectors, donut or ring cushions, and the recommended frequency of patient weight shifts, suggesting continued reliance on outdated or ineffective practices. In the Wound Characteristics domain, errors were noted in items concerning massaging bony prominences and interpreting eschar, both of which are essential for safe wound assessment and management. These findings emphasize the need for targeted educational interventions, reinforcement of evidence-based guidelines, and hands-on clinical training to strengthen nurses' competencies in pressure ulcer prevention and wound care.

Problem 4: What is the percentage of correct responses on wound characteristics as measured by PPURKT?

Table 4: Highest-Scoring Items (Strengths of Nurses)

Question No.	Question Description (Summary)	Percentage Correct (%)
Q39	Braden Scale documentation requirement	90.8%
Q2	Pressure ulcers can occur in any patient	90.5%
Q47	Risk assessment should be performed on admission	90.1%
Q9	Characteristics of Stage 4 pressure ulcer	89.8%
Q44	Skin is the largest organ	89.0%

Table 4 shows the five highest-scoring items on the Pieper Pressure Ulcer Knowledge Test (PPURKT), highlighting areas where nurses demonstrated strong and consistent knowledge in pressure ulcer care. These items reflect basic concepts that nurses understand well and apply correctly in daily practice. The highest-scoring item, Q39 (90.8%), indicates that most nurses recognize the importance of documenting a patient's Braden Scale score, reflecting awareness that proper risk assessment and documentation facilitate early identification of patients at risk for pressure ulcers. For Q2 (90.5%), respondents correctly acknowledged that pressure ulcers can occur in any patient regardless of age or health status, demonstrating knowledge that all patients require careful monitoring. Q47 (90.1%) assessed nurses' understanding that a pressure ulcer risk assessment must be performed upon admission, emphasizing the value of early evaluation to identify high-risk individuals. Q9 (89.8%) focused on the characteristics of a Stage 4 pressure ulcer, showing nurses' competency in recognizing severe ulcer stages, which is essential for guiding appropriate

treatment. Finally, Q44 (89.0%) highlighted basic anatomical knowledge by confirming that the skin is the largest organ, supporting nurses' understanding of skin health and wound care. Collectively, these results indicate that nurses possess strong foundational knowledge in risk assessment, staging, and skin physiology, which are critical for effective prevention and management of pressure ulcers. However, when contrasted with lower-scoring items, these findings also underscore the need for continued education to address persistent knowledge gaps in more complex areas of wound assessment and prevention.

Ethical Considerations

This study was conducted in strict accordance with ethical principles for research involving human participants. Approval was obtained from the institutional authorities of Quirino Memorial Medical Center and the relevant ethics review committee prior to data collection. Participation was entirely voluntary, and nurses were fully informed about the study's purpose, procedures, and their rights, with informed consent obtained from all respondents. Participants were assured that they could withdraw at any time without any penalty or impact on their employment. Confidentiality and anonymity were strictly maintained, with no identifying information collected and all responses treated with the highest level of security; data were used solely for academic purposes and securely stored to prevent unauthorized access. The study posed minimal risk, as it involved only a structured knowledge assessment, with no anticipated physical, psychological, or emotional harm, and the researchers ensured that all findings were reported honestly, accurately, and transparently.

Conclusion

The study concluded that nurses' knowledge of pressure ulcer care is generally adequate in foundational areas, particularly in staging, risk assessment, and basic prevention strategies. Results showed that nurses demonstrated moderate knowledge in Prevention Strategies (73.54%) and Pressure Ulcer Staging (73.31%) and strong understanding of key items such as Braden Scale documentation, risk assessment upon admission, and identifying Stage 4 pressure ulcers. However, critical gaps were observed in the Wound Characteristics domain (53.93%) and in specific items related to advanced prevention and wound assessment, including misconceptions about heel protectors, donut cushions, massaging bony areas, and interpreting eschar. These findings highlight the need for targeted, evidence-based training, updated clinical guidelines, and regular competency assessments to address these gaps. Strengthening nurses' knowledge in these areas can enhance safe and effective pressure ulcer prevention and management, particularly in high-risk clinical settings.

Reccomendations

Based on the results and conclusions of this study, several recommendations are proposed to enhance pressure ulcer prevention and management at Quirino Memorial Medical Center (QMMC). For nursing practice, it is recommended to implement standardized protocols, including repositioning schedules, skin assessment checklists, and Braden Scale monitoring, while avoiding outdated practices such as heel protectors, donut/ring cushions, and massaging bony areas, and to strengthen wound assessment through wound photography, proper documentation, and staging verification. For nursing education and training, regular competency-based programs should focus on wound characteristics, tissue identification (slough, eschar, granulation), and evidence-based prevention practices, incorporating simulation-based exercises, visual learning tools such as photos, diagrams, and case studies, and annual PPURKT-based skill validation to update knowledge. Nursing administration should ensure the availability of adequate equipment, establish a hospital-wide pressure ulcer prevention committee, integrate findings into the continuing professional development (CPD) plan, and use the results to inform policy updates, quality improvement initiatives, and audit systems. Finally, for future research, it is recommended to explore nurses' attitudes and practices to complement knowledge assessments, conduct qualitative studies to understand the persistence of misconceptions, and examine correlations between knowledge scores and actual pressure ulcer incidence rates at QMMC.

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