The Impact of Education and Feedback on the Accuracy of Pressure Injury Staging and Documentation by Bedside Nurses

Kathleen Sankovich*, DNP, RN, Laura Ann Fennimore*, DNP, RN, Rose L. Hoffmann*, PhD, RN & Dianxu Ren*, PhD

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Abstract

Background: Pressure Injuries (PIs) are largely preventable. Accurate documentation of PI stage or progression is a key quality measure.

Local Problem: Nurses frequently fail to accurately assess and document their findings in the electronic medical record. This project sought to increase nurses’ knowledge and accuracy of staging and documentation of PIs.

Method: Educational interventions; direct observation of PI status; review of nurse documentation; feedback; and referrals to wound, ostomy, and continence nurses (WOCNs).

Interventions: Nurses completed a pre- and post-test and online training modules, and participated in training sessions. Clinical experts completed direct skin observations and provided feedback about PI staging.

Results: There was a statistically significant improvement in nurses’ knowledge about PIs (p = 0.004). Skin assessments were conducted on 108 patients (13 PIs identified). The bedside nurse accurately assessed a PI stage in only 31% of these observations. Referrals to WOCNs increased by 18% compared to the baseline period.

Conclusions: Educational interventions enhanced nurses’ knowledge; however, appropriate PI staging may require skills development and validation to build competency.

Keywords: pressure injury, pressure ulcer, wound care, prevention, evidence-based practice, prevalence, assessment, documentation, education
Problem Description

Pressure injuries (PIs) are painful, costly, and largely preventable, and they represent key opportunities for nurses to improve the quality of patient care. The National Pressure Ulcer Advisory Panel defines a PI as the “localized damage to the skin and underlying soft tissue usually over a bony prominence or related to a medical or other device.” Patients at higher risk for PI development include those with poor nutritional status, impaired tissue perfusion, immobility, and comorbidities such as diabetes. In 2014, the Agency for Healthcare Research and Quality reported that PIs affected over 2.5 million patients annually at a cost of $20,900 to $151,700 per pressure injury. Each year, approximately 60,000 deaths are a direct result of a PI. The Patient Safety Authority (PSA) described hospital-acquired pressure injuries (HAPI) as the fifth-most common event reported through the electronic interface by patient safety officers.

Documentation of PI risk poses many challenges, including variability in assessment skills, knowledge deficit, type of skin risk assessment scale utilized, and electronic medical record inefficiencies. The Medical Care Availability and Reduction of Error (MCARE) Act was enacted in Pennsylvania in 2002 and defined patient safety events and required reporting structures for patient injuries. In 2008, the Centers for Medicare and Medicaid Services (CMS) included PIs in the Hospital-Acquired Condition Reduction Program and no longer reimburses hospitals for care expenses that result from the development of a Stage 3 or Stage 4 PI. The PSA issued guidelines effective January 1, 2018, that require Pennsylvania hospitals to report HAPIs that develop and/or progress or worsen as patient safety events, regardless of the patients’ illness, contributing factors, and/or care refusal.

In anticipation of these new reporting requirements, the patient safety officer reviewed documentation congruence between the hospital occurrence reporting system and nurse documentation in the medical record compared to observations noted by wound, ostomy, and continence nurses (WOCNs). Significant variation in staging of PIs was noted between staff nurses and WOCNs. For example, some PIs identified by bedside nurses as Stage 2 were assessed by WOCNs to be either Stage 3 or incontinence-associated dermatitis. Improving accurate nursing assessment and documentation of PIs is essential to enhance patient safety and reduce patient discomfort and risk for increased morbidity and mortality. Inaccurate documentation of publicly reported quality metrics “including PIs” can negatively impact hospital reimbursement and financial viability.

The purpose of this quality improvement project was to enhance the accuracy of bedside nurse assessment and documentation of PIs following completion of an online training module and direct feedback about the nurses’ assessment and documentation.

Rationale

The literature describes limited evidence of the accuracy of nurses’ assessment skills and knowledge related to PI staging and documentation. Only 55% of 647 nurses responding to a wound care study conducted in 2012 were able to identify the stages of PIs in their patients. The authors also noted that only 32% of the respondents to this survey acknowledged that they had received sufficient education on chronic wounds in their basic nursing education program. Dahlstrom et al. conducted a quality improvement campaign to improve identification, documentation, and treatment of PIs. The authors noted complete documentation (including stage, size, and location) of the PIs improved from 29% to 46% following the implementation of a wound assessment form and point-of-care reminders. While this campaign demonstrated a significant increase in complete documentation, more than 50% of the reported injuries were inappropriately documented. Clearly, problems have been identified with nurses’ knowledge of how to accurately stage and document pressure injuries.

Problems With Nursing Staging

Beal and Smith conducted a retrospective study of initiatives to reduce inpatient PI prevalence in a large community hospital over a 10-year period. The PI prevalence rate in this institution was consistently above the national average. The organization created a wound committee charged with oversight of PI activities. Over six years, they implemented several initiatives to reduce the incidence, including standardized PI prevention training with a self-learning staging module, implementation of evidence-based practices, and care plan prompts in the electronic medical record. Their relentless efforts resulted in a 6.4% reduction in HAPIs.
Critical care nurse knowledge related to PI prevention and staging was described in a post-intervention descriptive study by Miller et al. Over a two-year period, nurses in the medical and surgical intensive care units were provided with various educational programs (e.g., lectures, self-learning modules, wound care nurse shadowing). The authors utilized the Pieper-Zulkowski PI knowledge test to evaluate nursing knowledge of prevention, risk identification, and staging. The overall score for knowledge of PI staging was 81%, compared to an overall score of 70% for knowledge of prevention strategies.¹²

The Veterans Health Administration (VHA) embarked on a journey to reduce PIs in all settings (i.e., hospital, long-term care, outpatient) utilizing a virtual breakthrough series model. This approach used a rapid cycle of change coupled with evidence-based practices, clinical expert and quality improvement coaching on each multidisciplinary team, and a prevention bundle. A total of 38 teams throughout the VHA network participated in this study. The most common interventions were implemented with the following frequencies: staff education 68% (26 out of 38), documentation templates implemented 61% (23 out of 38), and utilization of equipment (e.g., protective dressings, chair cushions) 55% (21 out of 38). These interventions led to a 44% reduction in PI development, decreasing the PI incidence from 1.6/1000 to 0.9/1000 bed days. This was statistically significant (p = 0.017).¹³

Problems with Documentation
Accurate documentation of patient’s condition, plan of care, and treatments is an essential component of quality nursing care. Thoroddsen and colleagues conducted a cross-sectional descriptive study to review the completeness of PI documentation. Accuracy and completeness of documentation was defined as the correlation between the data, the patient’s presentation, and the care delivered. Their findings indicated that only 60% of the documentation in the medical record reflected a PI and only 42% of the patients’ records included documentation of PI prevention interventions. Risk factors for PIs were rarely identified. The authors concluded that the lack of documentation can impact patient safety and lead to adverse outcomes.¹⁴

No studies were identified that evaluated the impact of educational interventions in combination with direct feedback to nurses following expert skin assessment and documentation review.

Project Aims
The specific aims of this quality improvement project were to:

1. Increase bedside nurse knowledge of PI assessment, staging, documentation, and occurrence reporting
2. Improve the accuracy of bedside nurse assessment and staging of PIs
3. Improve bedside nurse documentation of PIs in the medical record and occurrence reporting system
4. Increase the number of wound, ostomy, and continence nurse (WOCN) referrals

Methods
Donabedian’s theoretical model for assessing health quality in terms of structure, process, and outcomes guided the development of this project. The project occurred within the structure of a medical/surgical inpatient unit. Improvement in nurse knowledge regarding assessment and staging of PIs served as the processes examined in this project. Outcomes were evaluated comparing pre- and post-intervention scores demonstrating changes in nurse knowledge and accuracy of pressure injury staging and the number of WOCN referrals.¹⁵ The Standards for QUality Improvement Reporting Excellence (SQUIRE) 2.0 Guidelines provided a framework for this project.¹⁶

Setting
This quality improvement project took place in a 315-bed, community-based, acute-care hospital and Level II trauma center affiliated with a large integrated delivery network in Western Pennsylvania. A 43-bed medical-surgical unit served as the intervention pilot unit. This unit was identified in 2017 as having one of the highest rates of PIs in this hospital (4.17%). Patients on this unit were thought to be at higher risk for PIs due to long length of stay and complex care needs.

Sample
The patient sample included all patients admitted to
the 43-bed medical-surgical pilot unit from August–November 2018. The patient population on this unit included patients with varied medical diagnoses (e.g., stroke, diabetes) and post-operative surgical patients (e.g., colorectal, vascular, or other surgical procedures). The staff sample included all 41 registered nurses (RNs) and two licensed practical nurses (LPNs) on this medical-surgical unit.

**Ethical Considerations**

This project was approved by the health system's institutional review board and the hospital's evidence-based practice and research councils. An abstract of the project was submitted to the university’s human research protection office, which agreed that this is a quality improvement project and did not require full review by the institutional review board. All data collected was identified, documented in an Excel spreadsheet, and stored in a cloud-based data storage secured through the health system’s information technology network with restricted access, and, if applicable, was transmitted utilizing encryption to safeguard the information.

**PI Staging Discrepancy Assessment**

A baseline assessment to identify possible PI staging discrepancies was completed using occurrence reports submitted from August through November 2017 and was repeated during the intervention period from August through November 2018. The project coordinator compared the description of the PI in the occurrence report with nurse documentation in the medical record.

**Education Program**

A two-part education program targeted toward improving nurses’ knowledge related to PI staging was delivered to nurses on the pilot unit. Before and after the education interventions, nurses completed a 15-question test developed by the project coordinator. This pre- and post-test included 10 case descriptions of PIs, and participants were asked to identify the appropriate PI stage. Five additional questions addressed reporting and appropriate documentation requirements. The test content was reviewed by a random sample of WOCNs in the health system to assure clinical accuracy.

Part 1: All nurses on the pilot unit were asked to complete a pre-test to assess their knowledge related to PIs and were assigned the online National Database of Nursing Quality Indicators (NDNQI) pressure injury training modules 1 and 2 (v. 5.0). Module 1 addressed PIs and staging; module 2 covered other wound types and skin injuries (e.g., diabetic ulcer, venous stasis ulcers). Nurses were asked to complete these modules as a part of their scheduled work within a 30-day period. Each nurse that completed the training modules provided an electronic certificate to the project coordinator.

Part 2: The project coordinator provided four face-to-face educational sessions regarding assessment, staging, and appropriate documentation of PIs, as well as the required MCARE reporting. Nurses then completed a post-test within 28 days of completing the online and face-to-face training sessions. The project coordinator provided direct feedback to the bedside nurses on the results of their pre- and post-test results. For each incorrect answer selected, the project coordinator reviewed the appropriate stage and the rationale with the nurse.
Skin Observations
Skin observations were conducted once a month for four consecutive months. The project coordinator conducted a full assessment of all patients on the pilot unit along with unit-based skin care champions. These bedside nurses are required to complete the four NDNQI PI training modules (PIs and staging, other wound types and skin injuries, PI survey guide, and community vs. hospital/unit acquired PIs); accompany the WOCN on their unit to assess PIs; and attend monthly educational meetings. This assessment included a head-to-toe inspection of the patients’ skin, noting the color, turgor, temperature, presence of wounds or lesions, and any areas of moisture.

Medical Record Audits
The project coordinator reviewed the skin assessment documented in the medical record to determine congruence between the observation and the last documented skin assessment. Patients with Stage 2 or greater PIs were referred to a WOCN. The project coordinator discussed any discrepancies between the nurse’s documentation of PI stage and the findings noted by the skin care champion or WOCN with the nurse caring for the patient, reinforcing information from the online training modules and documentation in service training. The project coordinator shared a summary of assessment and documentation findings during the monthly staff meetings to give feedback for all nurses on this unit. Nurses absent from the staff meetings received the information in a secure email.

WOCN Referrals
The average number of WOCN consults per month for the four-month intervention period was compared with the same period in 2017 to ascertain if there was an increase following the educational intervention and direct observations.

Results
Sample Description
The sample of nursing staff completing the education program included 41 RNs and two LPNs on a medical or surgical unit in a community hospital.

PI Skin Discrepancies
Twenty-three PIs were reported through the occurrence reporting system in the baseline period of August-November 2017 on the pilot unit. The WOCNs noted PI staging discrepancies in 22% (n = 5) of the cases reporting in the baseline period. Thirty-eight PIs were reported in the occurrence reporting system in the post-intervention period of August-November 2018. The WOCNs noted PI staging discrepancies in 24% (n = 9) of the cases reported in the post-intervention period.

Education Program Outcomes
Thirty-two RNs (74%) and two LPNs (100%) completed the two online NDNQI pressure injury training modules. Staff also attended a face-to-face training offered by the project coordinator addressing skin assessment, staging, prevention strategies, and documentation.

The pre- and post-test results and follow-up staff discussions were entered in an Excel spreadsheet. Individual questions were evaluated by absolute frequency and the percent correct for the pre- and post-test results.

Table 1. Pre/Post-test Results

<table>
<thead>
<tr>
<th>Question</th>
<th>Pre N = 32</th>
<th>Post N = 32</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q1</td>
<td>31 (93.9%)</td>
<td>31 (96.9%)</td>
</tr>
<tr>
<td>Q2</td>
<td>29 (87.9%)</td>
<td>21 (65.6%)</td>
</tr>
<tr>
<td>Q3</td>
<td>32 (97.0%)</td>
<td>29 (90.6%)</td>
</tr>
<tr>
<td>Q4</td>
<td>33 (100%)</td>
<td>32 (100%)</td>
</tr>
<tr>
<td>Q5</td>
<td>28 (84.8%)</td>
<td>31 (96.9%)</td>
</tr>
<tr>
<td>Q6</td>
<td>30 (90.9%)</td>
<td>32 (100%)</td>
</tr>
<tr>
<td>Q7</td>
<td>24 (72.7%)</td>
<td>28 (87.5%)</td>
</tr>
<tr>
<td>Q8</td>
<td>15 (45.5%)</td>
<td>25 (78.1%)</td>
</tr>
<tr>
<td>Q9</td>
<td>33 (100%)</td>
<td>32 (100%)</td>
</tr>
<tr>
<td>Q10</td>
<td>17 (51.5%)</td>
<td>31 (96.9%)</td>
</tr>
<tr>
<td>Q11</td>
<td>31 (93.9%)</td>
<td>31 (96.9%)</td>
</tr>
<tr>
<td>Q12</td>
<td>33 (100%)</td>
<td>32 (100%)</td>
</tr>
<tr>
<td>Q13</td>
<td>17 (51.5%)</td>
<td>26 (81.3%)</td>
</tr>
<tr>
<td>Q14</td>
<td>33 (100%)</td>
<td>32 (100%)</td>
</tr>
<tr>
<td>Q15</td>
<td>30 (90.9%)</td>
<td>27 (84.4%)</td>
</tr>
<tr>
<td>Total</td>
<td>84.1 + 9.08%</td>
<td>91.4% + 8.33%</td>
</tr>
</tbody>
</table>

Overall Knowledge Improvement \( p = 0.004 \)
post-test respectively, noting the direction of change per question. Thirty RNs and two LPNs completed the pre- and post-test. Nurses demonstrated improved knowledge in eight of the 15 questions on the post-test. The total score for the pre- and post-test questions was calculated by using a paired sample t-test. Utilizing the Statistical Package for the Social Sciences (SPSS) software version 25.0.0 for Windows, a p value of .05 was considered statistically significant. The average pretest score mean was 84.1% ± SD 9.08% and the average post-test mean score was 91.4% ± SD 8.33%. There was a statistically significant improvement (p = 0.004) in nurse knowledge about PIIs following the completion of the online educational modules and face-to-face training sessions offered by the project coordinator (Table 1).

Skin Observation and Medical Record Audit

A “snapshot” observation was conducted on one day each month for four consecutive months between August–November 2018 on the pilot unit. The project coordinator, a unit-based bedside nurse identified as a skin care champion, and a WOCN conducted the observations. On the days of the direct observations, 143 patients were admitted to the pilot unit. A skin assessment was conducted on 108 (76%) of these patients. (Note: A few patients refused a skin assessment or were off the pilot unit for tests at the time of the skin assessment.) A full skin assessment included a head-to-toe inspection of the patient’s skin, noting its color, turgor, and temperature, as well as any presence of wounds, lesions, or areas of moisture. Thirteen PIIs were identified. The project coordinator noted nine staging discrepancies between the documented stage of the PI by the bedside nurses and the stage identified by the skin care champion and project coordinator. For example, a nurse assessed a patient as having incontinence-associated dermatitis; however, the skin care champion and project coordinator assessed the wound as a Stage 2 PI. The bedside nurse documented accurate PI staging in only 31% of PI observations. The staging discrepancies noted between the bedside nurse, skin care champion/project coordinator, and WOCN are noted in Table 2.

WOCN Referral Results

The monthly WOCN referrals increased by 18% compared to the baseline period. Twenty-eight WOCN referrals were submitted from August through November 2017.
Thirty-two referrals were submitted from August through November 2018.

Discussion

This quality improvement project was designed to improve the accuracy of nurse assessment, staging, and documentation of PIs by the bedside nurses following completion of an online educational module, reinforced by a face-to-face session highlighting appropriate documentation of PIs. The project incorporated a review of documented PI assessment and staging by the bedside nurse and direct observations with immediate feedback for any discrepancies noted. A statistically significant improvement in knowledge regarding PIs following these interventions was identified through administration of a pre- and post-test. The direct observation feedback served to reinforce accurate PI assessment and staging. For example, during one of the direct observations, the bedside nurse assessed a PI as unstageable (wound covered in eschar and slough), but based on the characteristics (partial thickness loss of the dermis layer, red or pink wound bed) and WOCN evaluation, it was determined to be a Stage 2 PI. These results were consistent with findings noted by Miller et al. that described improved staging of PIs following educational programs including self-learning modules and lectures.12

There was a negligible increase in PI staging discrepancies from the baseline data in the occurrence reporting system (22% to 24%). Notably, 44% of the PIs reported in this system in the post-intervention phase were entered by nurses who had not completed the online or face-to-face training. Nurses in this study failed to document an accurate assessment of the PI stage in 69% of the observed cases. Appropriate PI assessment and staging are skills that may develop over time and may require validation by clinical experts to build competency.

Thoroddsen et al. noted that incomplete or inaccurate documentation could lead to missed hand-off communication opportunities affecting patient safety and outcomes. In this project, 9% (n = 10) of the skin assessments and 30% (n = 108) of the preventive interventions were noted to be inconsistently documented or absent in the electronic medical record. Although a review of documented interventions was not a defined objective of this quality improvement project, the project coordinator noted the lack of documentation of interventions used to treat or prevent PIs. This project heightened awareness of accurately assessing and staging PIs as well as drew attention to the need to document preventive strategies. Results of the project findings were shared through the monthly staff meetings and daily care huddles.14

The Wound, Ostomy and Continence Nurses Society’s scope of practice outlines the contribution of the WOCN to improve “the quality of care, life, and health of healthcare consumers with wound, ostomy, and/or continence care needs.”17 This project demonstrated the enhanced value of the expertise of the WOCN to support accurate assessment of PIs and enhance bedside nurse competency. WOCN referrals may be an underutilized resource in the care of patients with PIs. There may be an opportunity to use telemedicine to enhance a WOCN’s ability to assess, diagnose, and manage PIs and other chronic wounds; the successful use of telemedicine in dermatology suggests the promising potential of bringing clinical expertise to the management of PIs and capitalize on limited WOCN resources.18

Limitations

This project was piloted on one nursing unit and included a small convenience sample. The project coordinator was not able to require or mandate training for this quality improvement project; however, nurses were strongly encouraged to participate in the education strategies. Nurse scheduling complicated the conduct of this quality improvement project. It was not possible to assess improvement in individual nurse assessment skills, as different nurses frequently were assigned on each of the observation days. This project did not include an assessment of prevention or treatment interventions that were incorporated into the plan of care.

Implications for Practice

Pressure injuries represent a serious patient safety concern that may be prevented or minimized with accurate assessment by the bedside nurse and referral to a WOCN. As PIs develop or worsen, they can prolong hospitalization, lead to infection, impair mobility, and increase morbidity and mortality. This project demonstrated increased nurse knowledge following an online and face-to-face educational program about PIs. The project confirmed that nurses frequently fail to correctly assess, stage, and document their findings. It
is imperative that nurses accurately assess and stage 
PIs in order to implement appropriate interventions for 
prevention and treatment.

The education program and assessment strategies 
described in this paper would be enhanced with 
mandatory participation in the education strategies 
and ongoing feedback provided to the bedside 
nurses regarding the accuracy of their assessment, 
staging, and documentation of PIs, with support from 
a WOCN. Ongoing education about PI assessment, 
staging, and documentation requirements should be 
corporated into the annual nursing competencies 
to ensure appropriate actions are implemented. The 
NDNQI pressure injury training modules may serve 
as an effective educational strategy to increase nurse 
knowledge about appropriate assessment and care of 
pressure injuries; however, this online training may be 
insufficient by itself and should be supported with 
regular skin surveillance rounds with direct feedback 
from clinical experts to enhance nurses’ assessment 
and staging skills. Hospitals will need to determine 
available resources to accomplish an improvement 
in accurate assessment, staging, and documentation 
of PIs. Future projects are warranted to evaluate 
interventions to prevent PI development or progression, 
and to study the impact of utilizing TeleWOCN\(^\text{18}\) in rural 
areas as well as hospitals that do not possess a WOCN.

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