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Interactive Evidence-Based Pressure Injury Education Program for Hospice Nursing

A Quality Improvement Approach

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ABSTRACT

PURPOSE: The purpose of this quality improvement (QI) project was to develop and implement an interactive, evidence-based pressure injury (PI) education program and evaluate the impact on frontline hospice nursing staff knowledge and practice.

PARTICIPANTS AND SETTING: The QI setting was a 12-bed inpatient hospice unit in a tertiary care Veterans Affairs (VA) Medical Center in Cleveland, Ohio. Nineteen licensed and unlicensed hospice nursing staff participated in this pre-/postworkshop project.

APPROACH: Chart audit determined baseline PI incidence and prevalence on the inpatient hospice unit. Interviews with key leaders informed the need to develop and implement innovative PI education opportunities. A literature review determined existing standards regarding the benefits of PI education for nursing staff but did not reveal measurable targets in hospice settings. We developed a PI education intervention based on Kolcaba's Theory of Comfort framework and a Plan-Do-Study-Act (PDSA) performance improvement model. Education was delivered in 7 workshops, lasting 2 hours each. Knowledge, practice, and comfort for inpatient hospice nursing staff were evaluated at baseline and 8 weeks following the final refresher visit. Workshop satisfaction was collected once using standard program evaluation forms after final workshop delivery.

OUTCOMES: We observed a significant improvement in staff PI knowledge ($P = .001$) and practice ($P = .001$) after initial workshop attendance and repeat engagement ($P = .001$). There was a large magnitude of effect for overall knowledge change ($d = 1.04$); similarly PI care planning and practice showed a large magnitude of effect and significant improvement ($P = .001$, $d = 2.64$). Staff comfort with job duties was stable with low effect size (mean 4.52, $d = 0.04$), and satisfaction with the workshop education was high (100% agreement with trainer effectiveness).

IMPLICATIONS FOR PRACTICE: We found that frontline hospice nursing staff knowledge and practice improved after attendance at our evidence-based PI education program. Results of this QI project have stimulated ongoing discussion on how to sustain this program in our hospice setting.

KEY WORDS: Educational intervention, End-of-life, Hospice, Palliative care, Pressure injury, Pressure ulcers, Prevention.

INTRODUCTION

Nursing staff benefit from receiving evidence-based (EB) pressure injury (PI) education.¹ Although there is no consensus on PI risk and onset in individuals at the end of life, most agree that the negative consequences of developing pressure injuries during

terminal illness are significantly magnified.^{2,3} Major healthcare system gaps remain in the routine delivery of interactive, EB PI education to both licensed and unlicensed frontline staff.²⁻⁹

Innovative delivery of recurrent EB PI education can enhance learning, retention of knowledge, and increase adherence to best practice recommendations.^{1,2,7} However, few facilities use

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strategies to deliver sustained interactive, EB PI education.⁷⁻⁹ Thus, there remains a substantial need to develop, implement, and evaluate the impact of recurrent, interactive, EB PI education on hospice nursing staff knowledge and practice.¹⁰⁻¹²

Congressional reports have noted their concern with the high costs associated with PI treatment of hospitalized veterans.¹³ The Office of Inspector General report of veteran facilities specifically highlights recommendations related to PI education, risk assessment, and skin care planning.¹⁴ Clinical practice guidelines include similar recommendations related to PI education.^{15,16}

Hospice care teams are experts at end-of-life symptom management in persons with 6 months or less to live. End-of-life care is focused on reducing patient suffering and pain, maximizing rest, and optimizing quality of life. It is invaluable to individuals, their families, and those who support the hospice philosophy of care that the delivery of routine, innovative, interactive, EB PI education to frontline hospice nursing staff is supported.

Interactive education programs for healthcare professionals provide value-added, hands-on, real-world processes to improve healthcare delivery.¹⁷ Interactive PI education programs, including visual wound assessment, manual measurement, face-to-face case discussion, and hospice-focused content, are lacking. The lack of staff time dedicated to PI education contributes to learning and retention barriers and can negatively impact hospice staff knowledge of PI management at end of life. In our quality improvement (QI) project, existing gaps provided the opportunity to ask the following clinically relevant question using the Population, Intervention, Comparison, Outcome, Time (PICOT) format as a framework for assessing educational interventions.¹⁸ For nursing staff on a Veterans inpatient hospice unit (P), how does formal, interactive PI education delivered via an interactive approach (I) compared to PI education with an informal nonhospice setting focus (C) affect nursing staff knowledge and practice (O), measured over period before and after 1 month of education (T)?

The aims of our project were to: (1) complete a hospice unit needs assessment to determine existing gaps, (2) develop and implement an interactive and EB PI education workshop for licensed and unlicensed hospice nursing staff, and (3) evaluate effects of PI education on knowledge and PI care planning (practice) change on months following education.

APPROACH: PROJECT DEVELOPMENT

The first step in our QI project was to conduct a hospice unit needs assessment. This assessment was completed by the lead

author (J.M.S.), an advanced practice nurse with a background in skin and end-of-life care (Table 1). The needs assessment included a chart audit and interview of key hospice nurse leaders and wound care experts. The interviews and needs assessment were completed during fiscal year 2017 at the VA Northeast Ohio Healthcare System (VANE OHS) a tertiary care Veterans Affairs (VA) Medical Center inpatient hospice unit in the mid-western United States. We measured PI incidence and prevalence through chart audit and by conducting informal interviews with hospice nurse leaders on the unit and a certified wound, ostomy, and continence nurse (CWOCN) who predominantly cared for hospice patients on the unit. The goal was to identify methods used to determine unit-based PI prevalence and incidence, data collection methods, and current practice used to complete PI risk assessment, staging, and skin care planning.

Chart audits identified the hospice unit-acquired pressure incidence of 0.4% (6 out of 136). The prevalence of skin breakdown (surgical wounds, PI, traumatic skin wounds, vascular ulcers, and malignant ulcers) acquired prior to hospice admission for these patients was 51% (69/136). The hospice CWOCN found that the most common type of skin breakdown was pressure (in 35.0%, 24 out of 69). Pressure injury incidence post-admission to hospice in fiscal year 2017 was consistently low; however, PI prevalence that same year was high. All wounds were managed by hospice nursing staff following admission and until wound closure or death.

Key Leader Interviews

Informal interviews were conducted with hospice nurse leaders and the CWOCN. They were asked to respond to 6 questions focusing on how PI knowledge is assessed among hospice staff and what staff are routinely involved in skin care. They were also asked to share thoughts about gaps in staff knowledge of skin, PI assessment, wound treatment, and care planning and the types of PI or skin breakdown data currently collected and tracked. They were also asked whether they believe staff are open to evaluation and participating in a QI project, and anticipated barriers they could help navigate. Hospice nurse leadership revealed a challenge regarding PI knowledge and practice evaluation using PI staging documentation alone. Many veteran care facilities have adopted a process of limiting wound staging and documentation to staff with specialized wound knowledge (CWOCNs or unit champions). Limited PI staging and documentation practices do help ensure more accurate PI identification. Nevertheless, limiting documentation responsibilities may negatively influence frontline nursing staff PI knowledge and practice.

TABLE 1.
Synopsis of Needs Assessment Processes

Inpatient Hospice Unit Domains	Sources	Findings
Pressure injury tracking	Informal interview and hospice unit pressure injury data	Pressure injury monitoring via incidence tracking alone (hospital acquired) is not an accurate reflection of skin care management needs in the unit; there is a need to evaluate pressure injury incidence and prevalence in the hospice unit
Pressure injury knowledge	Informal interview and baseline pressure injury knowledge test	There is a need to evaluate hospice nursing staff pressure injury knowledge
Pressure injury practice	Informal interview and baseline pressure injury care plan chart audit	There is a need to evaluate hospice nursing staff pressure injury risk assessment and care planning
Nursing comfort	Informal interview and baseline nurse comfort evaluation	There is a need to evaluate hospice nursing staff comfort with job duties before and after the planned pressure injury education workshop intervention

TABLE 2.
End of Life, Evidence-Based Pressure Injury Education Project Design

Education Type	Education Method	Education Duration	Outcome Evaluation
Formal workshop Phase I	Face to face Education workshop including pressure injury games	Workshop notification 2 wk (0.5 mo) Offered: 7 sessions over a 1-mo period 2 h each	Baseline Knowledge Practice Comfort Education workshop satisfaction
Refresher visits Phase II	Face to face Mix method teaching including PrI games	Offered: 3 sessions over a 1-mo period 15-20 min each	
Toolkit	Printed resources: <ul style="list-style-type: none"> • Binder of literature and tools • Laminated pressure injury treatment guide • Games 	Offered continuously Available on the unit after last workshop offering No project lead contact for 2 mo	
Following educational workshop	Face to face Chart audit and outcome data analysis <i>Clinical outcomes</i>	Offered 1 mo until all follow-up evaluations were completed 30-45 min each 1.5 mo	Knowledge Comfort Practice <i>Programmatic outcomes</i>

Abbreviation: PrI, pressure injury.

Interview responses revealed a need to evaluate and address hospice nursing staff PI knowledge and practice gaps via a formal evaluation of PI knowledge, chart audit, and a review of unit-based wound data collected by the CWOCN. Based on these findings, we concluded there was a need to develop and implement routine, interactive, EB PI education for all hospice nursing staff (Table 2).

Literature Review

We reviewed relevant literature using Open Access, through an EBSCOhost interface network recommended by the facility medical librarian to determine the current state of EB PI education. Advanced search methods included custom settings and allowed access to MEDLINE, CINAHL, PubMed, JAMA Network, Wiley Online Library, the *New England Journal of Medicine*, The National Guideline Clearing House, The Joanna Briggs Institute Evidence-Based Practice database, and VA Medical Center policy databases. Key search terms and relevant source documents are summarized in Table 3. A 10-year search limit was used (2008-2018) including any type of PI education. Forty-five documents were retrieved that met inclusion criteria from which we analyzed 19 original source articles (evidence levels IV-VII).¹⁹ These sources were used to generate recommendations for PI education, end-of-life PI risk assessment, and skin care planning. Literature regarding the benefits of PI education on nursing staff knowledge and practice was consistent across all source articles. The literature review did not reveal any standards in hospice nurse settings for repeat educational intervention for licensed and unlicensed frontline nursing staff. However, the review did confirm that repeated EB pressure education is clinically warranted and necessary for frontline hospice nurses and valuable nursing support staff, to ensure delivery of quality end-of-life skin care.

Theoretical Framework

Evidence-based PI knowledge, comfort assessment, and intervention were guided by Kolcaba's Theory of Comfort (ToC) framework.^{33,34} The education-based intervention was intended to address an unmet need (knowledge gap). The assessment of nurse comfort with job duties was intended to

foster knowledge seeking behavior. Comfort is a multifaceted concept significant to nursing.³⁴ The ToC visually depicted as a model for nursing practice holistically includes a large body of comfort interventions for individuals, including nurses with a general or specific comfort need.³⁵ Comfort needs defined within the theorist's taxonomic structure divides the complex meaning of comfort into 3 domains and definitions. The first was relief (having a specific comfort need met), the second was ease (achieving a state of calm or contentment), and the third was transcendence (achieving a state enabling the individual to rise above problems or pain).³⁵ We conducted comfort evaluations with 19 hospice nursing staff (participant group) using the Nurse Comfort Questionnaire (NCQ).³⁵ Specifically, we wanted to know if comfort with job duties was negatively or positively impacted in 19 hospice nursing staff who completed the NCQ and participated in the PI workshop.

Evidence-Based Pressure Injury Education

Findings from the NCQ, literature review, leadership interviews, and chart audits suggested PI education was the primary need for hospice nursing staff. Guided by the ToC framework, we developed our EB PI education intervention. Based on our literature, identified barriers to PI education were leadership support, time, patient care priorities, and a lack of formal PI education opportunities. Using the Comfort Model, evidence of knowledge seeking behavior typically leads to greater institutional integrity and improved adherence to best practices and policies. Following the Comfort Model, we obtained nurse management and service chief project support and arranged patient care coverage and nurse training away from the unit.

We used the Plan-Do-Study-Act (PDSA) improvement model to guide project planning. Data used to evaluate the outcomes of the program were collected using a pre-/posttest design; postintervention data were collected 3 months after the educational intervention. The project was implemented on a 12-bed inpatient hospice unit, at the tertiary care VANEHOS in Cleveland, Ohio, during fiscal year 2018. Nineteen full-time, English-speaking, inpatient hospice nursing staff (13 licensed RNs, 2 licensed practical nurses, 1 nurse

TABLE 3.
Source Document and Relevant Search Terms

Source Document	Search Term(s)
Hsu et al ¹	Pressure injury, education
Lizarondo ⁸	Pressure injury, classification and documentation
White ³	Pressure injury, care planning, hospice care
Altun and Demir Zencirci ⁵	Pressure injury, education, interactive workshops
Aydin and Karadağ ⁴	Pressure injury, risk assessment, nurses' knowledge and practice
Thomas ⁶	Pressure injury, nurse's knowledge, education
Young ⁹	Hospice care
Sibbald et al ²⁰	Risk assessment, hospice care
Slade ²¹	Pressure injury, care planning
Shifrin ²²	Education, hospice care
Dahlstrom et al ²³	Pressure injury, classification and documentation
Krešević et al ²⁴	Education
Smith and Waugh ²⁵	Pressure injury, risk assessment, nurses' knowledge and practice
Tweed and Tweed ²⁶	Pressure injury, education, nurses' knowledge and practice
Kelechi et al ²⁷	Hospice care, wound care
Wound, Ostomy and Continence Nurses Society Wound Guidelines Task Force ¹⁵	Pressure injury, risk assessment, hospice care
Graves and Sun ²⁸	Wound care, hospice care
Nenna ²⁹	Pressure injury, hospice care
Padula et al ³⁰	Pressure injury, risk assessment, evidence-based practice
Berwick and Hackbarth ³¹	Evidence-based practice
Jennings-Sanders et al ³²	Evidence-based practice

practitioner, and 3 certified nurse assistants who did not float to other units) were invited to participate after providing verbal agreement. Participant demographics are summarized in Table 4. All project activities were reviewed by Ohio University, Athens, Ohio, and Louis Stokes Cleveland VA Medical Center Institutional Review Boards in February 2018 and determined to be exempt from individual informed consent. Nursing participants were recruited to attend the EB program workshop through flyers, posters, and verbal announcements on the unit.

Workshop topics were taught by the project lead (J.M.S.); they included anatomy of the skin, PI terminology, risk factors to skin integrity at end-of-life, risk assessment, PI prevention, staging, and other quality skin care planning objectives. Curriculum specific to prevention, staging, and treatment was purchased from the National Pressure Ulcer Advisory Panel (NPUAP).³⁶ Interactive games created by the CWOCA and workshop leader (J.M.S.) such as “Pop the Pressure Injury Question” and “Pick a Pressure Injury Category” allowed nursing staff to engage with PI content while having fun to enhance learning and retention (Figure 1). A panel of 5 content

TABLE 4.
Participant Characteristics (n = 19)

Characteristic	n	%
Job category		
Registered nurse (RN)	13	68.5
Licensed practical nurse (LPN)	2	10.5
Nurse practitioner (NP)	1	5.3
Certified nursing assistant (CNA)	3	15.8
Age range, mean ± standard deviation, y	30-66, 49.6 ± 11.5	
Highest degree		
Associate	6	31.6
Baccalaureate	6	31.6
Diploma	3	15.8
Masters	3	15.8
High school diploma	1	5.3
Years of practice		
<1 y	1	5.3
1 to 5 y	1	5.3
5 to <10 y	3	15.8
10 to <15 y	2	10.5
15 to <20 y	2	10.5
≥20 y	10	52.6
Clinical certification		
Yes	4	21.1
No	15	78.9
Certification type		
Certified hospice palliative care nurse	3	75
Unspecified	1	25
Wound care	0	0

experts with expertise in skin health at end of life, research, and education methodologies reviewed the curriculum and materials. Nursing continuing education credits for 2 contact hours were provided to attendees upon workshop completion.

Seven, 2-hour, in-person, workshop sessions were offered over a 1-month period. Workshop activities took place in a conference room away from the hospice unit (Phase I). Attendance was taken at each educational session and verbal agreement reiterated. Three education refresher visits, 15 to 20 minutes each, on the hospice unit at standard weekly team meetings were provided by the workshop leader over 1 month after the final workshop offering (Phase II). A laminated treatment and wound product guide, unit poster, and PI toolkit were provided to the unit for 2 months. The toolkit included a national quick reference clinical practice guideline (including the palliative care population); educational materials from the National Pressure Injury Advisory Panel³⁶ a national consensus document on Skin Changes at Life's End²⁰; the Braden Scale for Pressure Sore Risk³⁷; VA Medical Center policy and handbooks on assessment, prevention, and management of pressure injuries, selected references concerning PI risk in the terminally ill^{30,38}; and PI chart audit tools from the Agency for Healthcare Research

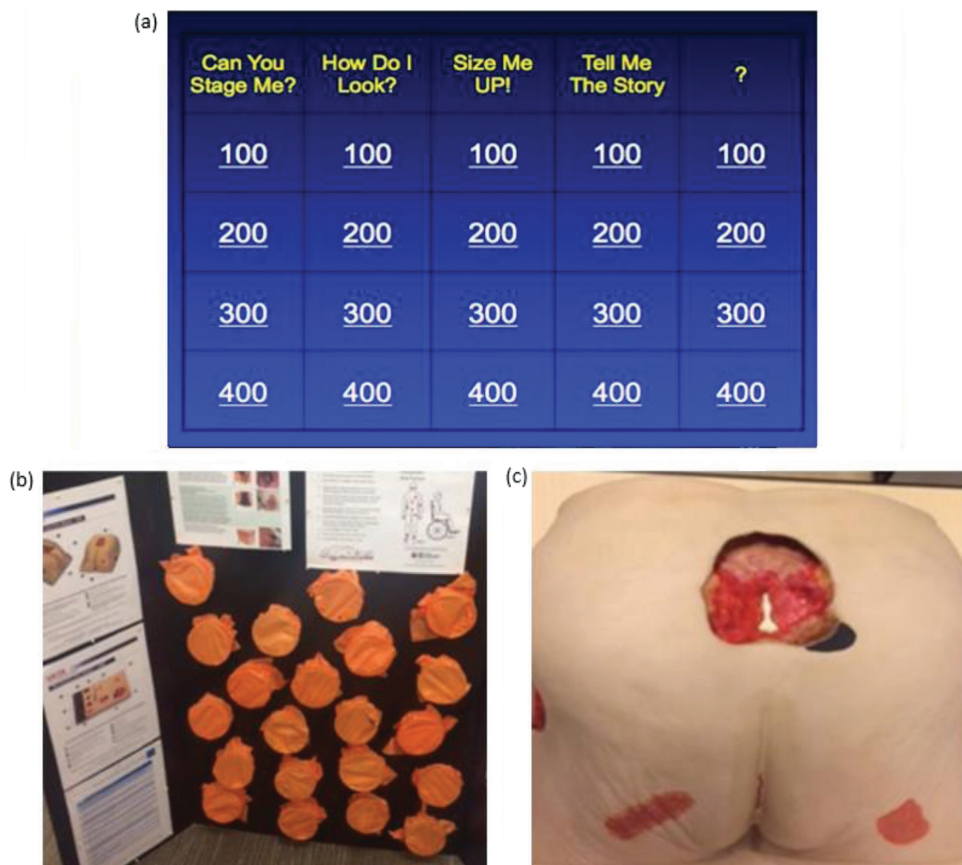


Figure 1. Interactive pressure injury workshop games to enhance learning and retention.

and Quality (AHRQ; <https://search.ahrq.gov/search?q=pressure+injury+chart+audit+tools+>), so that personnel could readily access them independently as needed. There was no contact with the workshop leader during this interval (Table 2).

We measured the impact of our QI program via multiple outcomes. A chart audit was conducted on a random cohort sample of 30 hospice patient records (15 pre- and 15 post-workshop) to evaluate changes in PI practice including risk assessment and care planning based on AHRQ standards. Sample records reviewed before and after the workshop included any patient directly admitted to or transferred to, and those who previously lived on, the hospice unit during both periods of chart audits. In addition, we measured PI at baseline (before the first educational session) and after the final workshop. The Pieper-Zulkowski Pressure Ulcer Knowledge Test (PZ-PUKT) was used to measure PI knowledge and knowledge seeking behaviors.³⁹ The PZ-PUKT is a 72-question tool that contains yes/no/don't know, nominal response options. Correct responses were assigned 1 point. Incorrect responses including "don't know" were assigned a score of 0. The PZ-PUKT measures 3 areas of knowledge including prevention, staging, and wound description/treatment. The PZ-PUKT scoring interpretation was low knowledge ($\leq 58\%$), moderate knowledge (59%-79%), and high knowledge ($\geq 80\%$). Knowledge seeking behaviors were captured by participant-reported information regarding the last time the individual listened to a PI lecture, article, NPUAP/European Pressure Ulcer Advisory Panel (EPUAP)/Pan Pacific Pressure Injury Alliance (PPPIA) 2014 guidelines, or searched the web for PI-related information before or after workshop participation (Figure 2).³⁶

Practice measures were guided by the AHRQ quality PI risk assessment and care plan chart audit tools.⁴⁰ We used the AHRQ *Assessment of Screening for Pressure Ulcer Risk* instrument to determine if risk was assessed by nursing staff upon patient admission and/or changes were noted in patient condition using an acceptable pressure risk assessment tool. The Braden Scale for Pressure Sore Risk³⁷ is used at our facility for measurement of PI risk. We also reviewed the chart to determine whether audited charts included a skin care plan with interventions based upon areas of identified PI risk. We also determined whether patients were assessed for PI-related pain, and we added a question to determine if a wound care goal had been established and if the patient and/or family had been provided with the wound-related care plan as recommended in the NPUAP PI guideline.

Compliance scores were calculated based on presence or absence of evidence in the documentation described earlier. Nursing comfort was measured using the NCQ to evaluate mean comfort related to job duties such as feeling competent, confident, supported, valued, and inspired, which may be impacted during a unit practice change. Workshop satisfaction was determined using an evaluation form designed for purposes of this QI project. Baseline evaluations were repeated 8 weeks after the third refresher visit. A second patient record sample was collected and audited 8 weeks after the final workshop.

Data Analysis

Data were analyzed using SPSS statistical software version 25 (Statistical Package of Social Sciences, Armonk, New York).

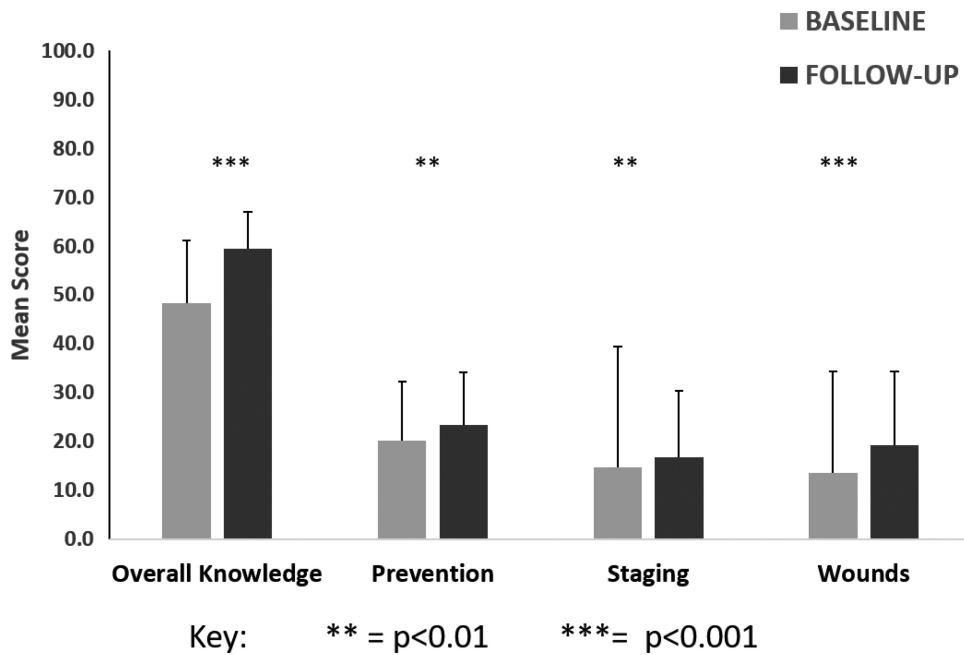


Figure 2. PZ-PUKT scores before and following PI educational intervention. PI indicates pressure injury; PZ-PUKT, Pieper-Zulkowski Pressure Ulcer Knowledge Test.

Pressure injury knowledge and knowledge seeking behaviors measured with the PZ-PUKT and nursing staff comfort measured with the NCQ were analyzed using a paired *t* test. We also compared 2 groups (RN vs certified nursing assistant [CNA]) at 2 time points (baseline pre- vs. postworkshop) using repeated-measures analysis of variance. Pressure injury practice was measured through 2 chart audits and analyzed using a χ^2 and Fisher exact test to determine differences in the proportion of patient charts that met quality practice criteria before and after attending the PI education workshop.

OUTCOMES

Twenty-one individuals attended the EB PI education workshop; data analysis is based on 19 who met inclusion criteria (Table 4). Staff were predominantly RNs; more than half (52/6%, n = 10) had more than 20 years’ experience. Significant improvements in knowledge were found in both CNA and RN groups at baseline and postworkshop (Figure 3). Following the educational intervention, screening for pain improved ($P = .003, d = 1.33$), as did end-of-life PI care planning and practice ($P = .001, d = 2.64$). Participants

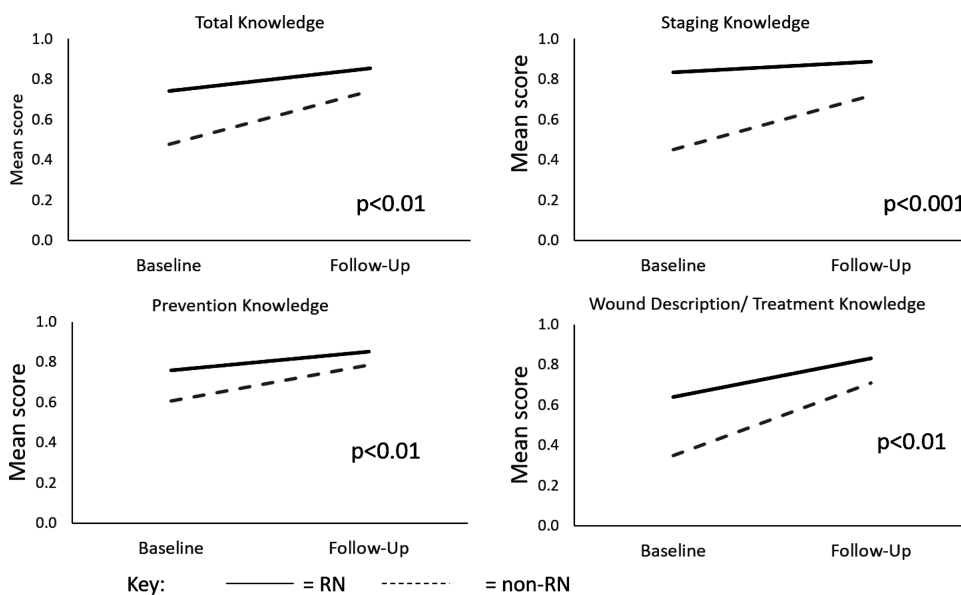


Figure 3. PI knowledge for RN and CNA before and following educational intervention. CNA indicates certified nursing assistant; PI, pressure injury.

TABLE 5.
Pressure Injury Knowledge Seeking Behaviors (n = 19)

Characteristic	Baseline Value		Follow-up Value	
	n	%	n	%
Listened to lecture (years ago)				
≤1 y	7	36.8	19	100
>1 y but <2 y	5	26.3	...	...
2-3 y	3	15.8	...	...
≥4 y	3	15.8	...	...
Never	1	5.3	...	...
Read an article (years ago)				
≤1 y	9	47.4	18	94.7
>1 y but <2 y	3	15.8	...	...
2-3 y	4	21.1	1	5.3
≥4 y	1	5.3	...	...
Never	2	10.5	...	...
Searched web				
Yes	10	52.6	15	78.9
No	9	47.4	4	21.1
Read NPUAP/EPUAP ³⁶ International Pressure Ulcer Prevention & Treatment Guide				
Yes	1	5.3	15	78.9
No	18	94.7	4	21.1

Abbreviation: NPUAP/EPUAP, National Pressure Ulcer Advisory Panel/European Pressure Ulcer Advisory Panel.

also engaged in independent behaviors in order to increase PI knowledge (Table 5).

Hospice nursing staff expressed comfort with job duties at baseline (mean 4.48), which remained unchanged post-workshop (mean 4.52, $d = 0.04$). Nursing staff comfort was not negatively impacted by participation in the EB PI education activity.

DISCUSSION

We conducted a QI project of licensed and unlicensed frontline hospice nursing staff providing care for patients on a 12-bed hospice unit at our VA hospital and found significant improvements in PI knowledge and practice following the educational intervention. We assert that use of innovative methods for delivering PI education improved knowledge retention and increased adherence to best practice recommendations.

Pressure injury development particularly at end-of-life can lead to significant complications including increased pain, suffering, and poor quality of life.¹⁵ Inaccurate PI documentation can also lead to serious clinical consequences. Limited PI staging responsibilities limited to only CWOCNs or champions are a beneficial system-wide approach to improve data management and care quality related to PI. Unfortunately, improved data management alone did not allow for assessment of frontline nursing staff PI knowledge gaps related to wound staging in a measurable and meaningful way. This QI project addressed the gap in care delivery. The QI project also complemented the facility's system-wide approach to PI staging and gained support from management of the hospice unit.

The primary limitations reported by participants and leadership were a lack of time and dedicated resources for education. While this QI project focused exclusively on hospice nursing staff only, we recommend inclusion of physicians, patients, and caregivers in future projects. We also recognized

that the NCQ tool did not capture other nursing job comfort themes such as burnout or compassion fatigue prevalent among frontline nursing staff.

CONCLUSION

Hospice nursing staff achieved improvements in PI knowledge and practice after participation in a 7-session workshop focusing on PI prevention and care. Findings from this QI project illustrated the need and benefit of providing routine pressure education for hospice nursing staff, a group often overlooked in PI care. We recommend routine delivery of innovative, interactive PI education, including games, to frontline nursing staff (including staff delivering end-of-life care) at least quarterly.

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