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Pressure Injury Prevention and Management

A Gap Analysis Using Key Stakeholder Engagement

Joyce Pittman ◆ Jo Ann Otts ◆ Bettina Riley ◆ Madhuri S. Mulekar

ABSTRACT

PURPOSE: The purpose of this study was to examine pressure injury prevention and management (PIPM) practices in an academic acute care setting. Specific aims were to (1) develop and examine key stakeholder engagement regarding PIPM practices, (2) develop a valid/reliable gap analysis instrument, and (3) conduct a gap analysis of current PIPM practices.

DESIGN: Mixed-methods convergent design and participatory action research.

SUBJECTS AND SETTING: A nurse-led council (Council) of key stakeholders from a large academic university healthcare setting was developed. The gap analysis was conducted in a southern gulf coast level I trauma academic acute care hospital in the Southeastern United States.

METHODS: A multidisciplinary key stakeholder Council with 27 members was developed to accomplish study aims using the participatory action research approach to train, promote, and foster key stakeholder engagement in all aspects of the research process. The Pressure Injury Prevention Gap Analysis Instrument (PIPGAI) was developed and psychometrically tested. A gap analysis of PIPM practices across a level I trauma academic acute care hospital was conducted using the PIPGAI.

RESULTS: The PIPGAI was developed using 2019 Pressure Ulcer/Injury Clinical Practice Guideline recommendations, an integrative literature review/appraisal, a concept map, and Council input. The overall PIPGAI content validity index of 0.95 demonstrated excellent content validity. The individual item content validity index scores ranged from 0.62 to1.0. Low-scoring items (0.62-0.75) were deleted or revised. Interrater reliability was demonstrated by percentage of agreement (62%-79%). Using a modified Delphi approach, items of disagreement were summarized and discussed until 100% consensus was achieved. A gap analysis of PIPM practices was conducted resulting in a cumulative score of 267/553 (48%), indicating gaps in PIPM practices. Fifty (73%) items had content present; 37 of 58 (64%) items had minimal detail, and 36 of 58 (62%) items were difficult or required notable effort to accomplish. Fifty items (63%) had a total score of 4 or less and were identified as a gap (range: 0-7).

CONCLUSIONS: The main outcome of this study was an innovative and evidence-based gap analysis process. The study provides (1) a model for key stakeholder engagement, (2) a valid/reliable gap analysis instrument, and (3) a method to evaluate PIPM practices.

KEY WORDS: Gap analysis, Key stakeholder, Participatory action research, Pressure injury/ulcer, Prevention, Psychometric testing, Stakeholder engagement.

Joyce Pittman, PhD, RN, ANP-BC, FNP-BC, CWOCN, FAAN, *University of South Alabama, College of Nursing, Mobile, Alabama.*

Jo Ann Otts, DNP, RN, NEA-BC, CENP, *University of South Alabama, College of Nursing, Mobile, Alabama.*

Bettina Riley, PhD, RN, *University of South Alabama, College of Nursing, Mobile, Alabama.*

Madhuri S. Mulekar, PhD, *Department of Mathematics and Statistics, University of South Alabama, College of Arts and Sciences, Mobile, Alabama.*

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Correspondence: *Joyce Pittman, PhD, RN, ANP-BC, FNP-BC, CWOCN, FAAN, University of South Alabama, College of Nursing, HAHN 2037G, 5721 USA Dr North, Mobile, AL 36688 (joycepittman@southalabama.edu).*

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INTRODUCTION

Regulatory, quality, and preeminent healthcare organizations consider hospital-acquired pressure injuries (HAPIs) an important patient safety issue and view their frequency as a measure of nursing care quality. Two and a half million patients annually develop a pressure injury (PI), and 60,000 patients die as a result.[1] The annual estimated cost of HAPIs is $26.8 billion, and the cost of PI care per patient ranges from $29,900 to $151,700.[1] Patients who develop a HAPI are more likely to have a longer length of stay, higher 30-day readmission rates, and/or die during that admission.[2-4] Despite numerous technological advancements and HAPI prevention strategies, HAPIs continue to occur. While evidence concerning prevalence is mixed, the Agency for Healthcare Research and Quality (AHRQ) reports that HAPI rates continue to rise across the United States.[5] We assert that the rise of HAPI rates reported by the AHRQ indicates the complexity of PI prevention and evidence indicating that not all PIs are preventable or avoidable.[3] For example, Pittman and colleagues[3] reported

that more than 40% of PIs in the critical care setting were unavoidable, indicating that approximately 60% were avoidable. As a result, hospitals must increase their attention to PI that can be prevented.

A level I trauma academic acute care hospital in Alabama identified PI prevention and management (PIPM) as a high priority after HAPI rates increased and incurring reimbursement penalties. High variation in PIPM practices was identified as a key challenge in this organization. Strategies to assess the current PIPM practices were identification of evidence-based practices, a gap analysis methodology, and key stakeholder engagement.

Evidence-based practices increase the likelihood of implementation when nursing care is based on a nursing theory.[6] Neuman's systems model[7,8] was used to guide this HAPI investigation. Neuman's model is built on evidence-based holistic nursing care provided on a continuum from prevention to resolution of the injury. A gap analysis can systematically identify the gaps by comparing current practice to evidence-based standards/guidelines through a gap analysis.[9] A gap analysis is recommended to assess and improve the quality and safety of care in hospitals.[10] Development of a gap analysis tool, specific to HAPIs, that is valid and reliable can be spread to other acute healthcare settings and augment nursing science.

Key stakeholder engagement that blended academic and practice leaders was a foundational component of this study. Stakeholder engagement is defined by the Patient-Centered Outcomes Research Institute (PCORI) as the meaningful involvement of patients, caregivers, clinicians, and other healthcare workers into all aspects of a research study.[11] The goal of the key stakeholder engagement was to leverage their expertise promoting research that is patient-centered, relevant, and useful for greater uptake of the findings within the organization.

A mixed-methods convergent design and a participatory action research (PAR) methodology are appropriate to engage key stakeholders in a meaningful way because they support holistic and evidence-based practice including objective (quantitative) and subjective (qualitative) data collection that is then integrated and compared for confirmation of the findings.[12,13] This integration is essential in the development of this gap analysis instrument as it ensures the intentional involvement of key stakeholders in research that directly affects their practice. In addition, the Donabedian Model and the STAR Model[14,15] are relevant for this study. The Donabedian approach for evaluating quality of care focuses on the domains of structure, process, and outcome(s). Structure refers to the physical and organizational attributes or characteristics; process refers to the care delivery provided to the patient; and outcome refers to the effect of the healthcare on the status of the patient and measurement of the identified outcome. In the Donabedian model, the unit, clinician, and patient characteristics are an integral part of the structure of the organization[14] and should be considered when undergoing quality improvement initiatives. The STAR Model emphasizes crucial steps in translating evidence across 5 stages or points: discovery of primary research, evidence summary, translation into action (guidelines), integration into practice, and process/outcome evaluation.[15] This model focuses on evidence quality and guidelines to guide practice and quality improvement.[15] The aims of this study were to (1) develop and examine key stakeholder engagement regarding PIPM, (2) develop a valid/reliable gap analysis instrument, and (3) conduct a gap analysis of current PIPM practices in an acute care hospital.

METHODS

Using a mixed-methods convergent design and PAR methodology,[10,11] a gap analysis instrument was developed to examine the current state of PIPM in a level I trauma center academic acute care hospital in the Southeastern United States (Alabama). Study procedures were reviewed and approved by the University of South Alabama Institutional Review Board (approval June 16, 2020, no. 1588094-1).

Study Procedures

The PAR methodology[16] guided development of a multidisciplinary key stakeholder Council focused on development, testing, and implementation of a PI gap analysis instrument. The PCORI Stakeholder Engagement in QuEstion Development (SEED) and Prioritization method was used to develop stakeholder priorities, research question development, and review of HAPI literature.[17] Together with the primary researchers, the Council guided development of the study methods, procedures, and results. In addition, key stakeholder-focused interviews further engaged, integrated, and confirmed the quantitative development of the gap analysis instrument. To evaluate Council engagement (group dynamics and partnership effectiveness), a link to Web-based survey was emailed to the Council members. The survey was developed using the work of Rawl and colleagues[18] and Schulz and colleagues[19]; it comprised 26 quantitative items and 7 qualitative items.

A task force from the Council was convened to identify the comprehensive list of evidence-based PIPM practices. The task force comprised clinical nurse managers (intensive care unit and emergency department), a WOC nurse, clinical nurse leader, nurse educator, and 3 doctoral-prepared College of Nursing faculty. The task force completed an integrative literature search and appraisal using the 2019 International Pressure Ulcer/Injury Clinical Practice Guideline (CPG) evidence as a foundation.[20]

A medical librarian conducted the literature search using PubMed, CINAHL, and Scopus using publication dates of 2018-2020. These dates were chosen to search beyond the inclusion dates of the 2019 CPG, which were 2015-2019. Search criteria included adults, acute care setting, and a strong focus on systematic reviews and clinical guidelines. Key words used were pressure injury (ulcer), prevention, decubitus ulcer, pressure sore, and hospital/patient/intensive care unit. A minimum of 2 reviewers performed an independent 2-phase literature appraisal with an initial review of the title and abstract, followed by a full-text appraisal. The Rayyan systematic review tool was used to manage the database searches in a systematic, blinded, and structured format.[21] The Johns Hopkins Nursing Evidence-Based Practice tools were selected to provide clarity and purpose in identifying, appraising, and synthesizing the best current evidence and translation to best practices.[22] The tools were beneficial in providing explicit and operational guidance to Council members when appraising best evidence.

Using evidence-based items identified from the literature appraisal, the Council organized the items using the Donabedian domains (structure, process, and outcome)[14] and developed a concept map (see Figure 1) to inform the development of the Pressure Injury Prevention Gap Analysis Instrument (PIPGAI). A concept map was used to identify essential components and to visually depict conceptual relationships[23] for the Council to discuss and better understand interrelationships.

The AHRQ's Toolkit for Using the AHRQ Quality Indicators[10] describes a structured evidence-based gap analysis

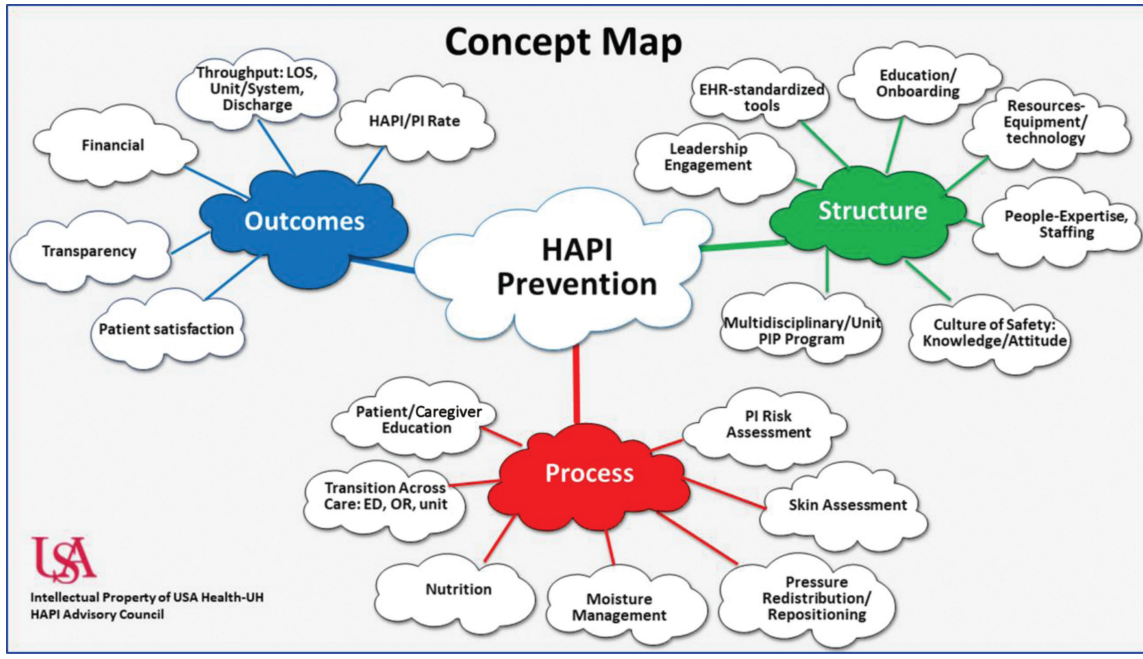

Figure 1. Concept map. ED indicates emergency department; EHR, electronic health record; HAPI, hospital-acquired pressure injury; LOS, length of stay; OR, operating room; PI, pressure injury; PIP, pressure injury prevention.

approach that was adapted to meet the needs of this study. It identifies that AHRQ identifies 5 steps when conducting a gap analysis: (1) identify area of focus; (2) describe and identify ideal or future state—where you want to be; (3) review and identify current state; (4) compare current state with ideal or future state, identifying gaps; and (5) determine plan to address gap.

The DeVellis'[24] stepwise approach for developing instruments was used in combination with the AHRQ Tookit.[22] Based on DeVellis' approach, the construct to be measured is identified, items that reflect the instrument's purpose are chosen, the format for measurement is determined, and expert review of the items is obtained.[24] Applying the methods described by the AHRQ and DeVellis, the PIPGAI was created using the comprehensive list of evidence-based recommendations and items from the literature appraisal and the concept map.

A panel of 8 nursing experts (7 content nursing experts from across the United States and 1 nursing research expert from Australia) participated in a Web-based survey to establish the content validity of the PIPGAI. The expert panel included a chief nurse executive from a large Magnet-accredited academic healthcare system, 3 WOC expert nurses, a certified advanced practice WOC nurse and educator, and 3 doctoral-prepared nurse researchers. Each expert electronically received an information packet that included the purpose of the survey, instructions for completion of the survey, and the PIPGAI. The content validity survey was developed using the recommendations of Wynd and colleagues along with Lynn and Sacks.[25-27] The survey required each panel expert to evaluate each evidence-based item for relevance, clarity, comprehensiveness, and appropriateness. Each item was rated on a 4-point scale except for comprehensiveness where a 2-point scale was used. Content validity index (CVI) results were reviewed by the Council and appropriate revisions made.

Using the validated PIPGAI, a gap analysis of PIPM practices was performed. Three trained investigators conducted a blinded data collection of the hospital's electronic medical record, facility intranet site, policies, protocols, quality/finance information, minutes of committee meetings, and nursing administrative information. Confirmation of data was tangible (written or electronic); verbal confirmation was not deemed acceptable. Gaps between evidence-based practices and current organizational practices were identified. The Council independently rated and prioritized each identified gap for action using a Web-based survey format on a Likert scale of 1 to 4 in which 1 = Item is not a priority; 2 = Item is a fair priority; 3 = Item is a priority; and 4 = Item is a top priority. Priority rating scores were compared between the Council member characteristic of direct care or non–direct care.

Data Analysis

Descriptive analysis was performed where continuous variables were summarized using means and standard deviations and categorical variables were summarized using frequencies and percentages. Council members were categorized into 2 groups: (1) direct care providers, operationally defined as staff who were in regular contact with patients, and (2) non–direct members, operationally defined as staff who did not encounter patients on a routine basis. Priority rating scores described previously were categorical; in order to determine if priorities differed between groups, a 2-sided t test was performed. All statistical analysis was conducted using JMP Pro V 15.2.0 (SAS Inc, Cary, North Carolina). Statistical significance of P value of .05 was used in the analyses.

PIPGAI Psychometric Testing

Content validity of the PIPGAI was examined by calculating the CVI for both individual item (I-CVI) and total scale (S-CVI). At the item level, I-CVI was computed as the proportion of experts who gave a rating of 3 or 4 for the relevancy of each item (ie, I-CVI = number of experts with 3 or 4 rating/total number of reviewers). The S-CVI was calculated

by summing the individual-item CVI scores and dividing by the number of items, providing an average I-CVI across items.[26,28-30] Based on standards advocated by Polit and colleagues,[29] items with I-CVIs of 0.78 or higher and S-CVI of 0.90 or higher indicate excellent content validity.

Reliability addresses consistency when measuring the stable attributes of an instrument.[31] The items in the PIPGAI are heterogeneous and diverse in character or content; thus, determining reliability using internal consistency or intraclass correlation, testing is not the best approach. However, for thoroughness and transparency, we did examine internal consistency testing using Cronbach alpha. In this study, in addition to internal consistency, we examined reliability of the PIPGAI using percentage of agreement of the items across the raters and a modified Delphi approach. This task was performed by a certified WOC advanced practice nurse, an organizational system nursing expert, and a nursing student. The student nurse data collector was included in the study intentionally to determine how easy or difficult the gap items were to identify for novice nurses. Each research team member received training on the purpose, content, and use of the instrument, and how to apply the scoring rules.

RESULTS

Aim 1: Council Development and Engagement

Twenty-seven key multidisciplinary stakeholders participated in the Council; 7 were active in the initial stages, 5 joined in the final stage, and 15 were involved throughout the study. Attendance at the monthly Council meetings ranged from 8 to 18 over the 24 months of the study. The collaborative relationship across the Council was interactive, dynamic, and reciprocal, where feedback and reflection were used to achieve the desired outcomes. College of Nursing faculty members provided training to the Council regarding research study design, study procedures, evidence-based practice, and quality improvement methodologies (Strengths, Weaknesses, Opportunities, and Threats [SWOT] analysis; Gemba walk; Lean Six Sigma strategies), literature review and appraisal, and instrument design. Clinical practice members provided organizational and clinical operational guidance for implementation of evidence-based practice and nursing workflow. Characteristics of engagement were measured with quantitative and qualitative methods (Web-based survey) and were positive. In addition, the Council's engagement was demonstrated via development of 5 poster and oral abstracts presenting preliminary and final results of the study at 3 national and 2 international conferences.

Aim 2: Valid/Reliable Gap Analysis Instrument

The guideline used for the gap analysis instrument's evidence-based practices was the 2019 International Pressure Ulcer/Injury Clinical Practice Guideline (CPG).[20] The integrative literature search resulted in 108 studies from 3 databases: PubMed, CINAHL, and Scopus. Following review for relevance to topic and removal of duplications, 101 unique studies remained. A review of titles and abstracts by the Council task force identified 46 articles that met inclusion criteria. Following a full-text review by the Council task force, 32 articles remained for rigorous review and appraisal using the Johns Hopkins Nursing EBP appraisal tool.[22]

Based on findings from 32 studies incorporated into the integrative review and 2019 CPG recommendations,[20] 79 evidence-based practices were identified and organized using the Donabedian domains of structure, process, and outcomes. The Council then grouped these evidence-based practices into 19 concepts, and a concept map (Figure 1) was developed. The 19 concepts of the concept map included 7 structure concepts, 7 process concepts, and 5 outcome concepts.

Pressure Injury Prevention Gap Analysis Instrument

Applying the gap analysis methods described by AHRQ[10] and DeVellis,[24] a comprehensive list of evidence-based practice items from the literature review and concept map was used to develop the PIPGAI. A gap analysis instrument format and item characteristics of content present, level of detail, and ease of use was adapted from Pittman and colleagues'[32] previous work. The list of evidence-based practice items was organized in the gap analysis instrument according to the Donabedian domains of structure, process, and outcome,[14] and the 19 concepts identified by the Council. Three characteristics of each evidence-based item were measured by content present where 0 = no, 1 = yes; level of detail of the content where 0 = none, 1 = minimal, 2 = moderate, and 3 = comprehensive; and ease of use where 1 = accomplished easily, 2 = requires notable degree of effort, and 3 = difficult to accomplish.[32] Each item score resulted in a score ranging from 1 to 7. Individual item scores of the items' three characteristics (content present, level of detail, and ease of use) were computed by summing the characteristic scores of each item. The PIPGAI total score was computed by summing the individual total item scores (range: 79-553). The total percentage score was calculated by dividing the actual total score by the possible total score. Higher scores on the individual items and total score indicated stronger evidence of PIPM practices. Finally, once gaps were identified, priority rating of each gap item was conducted using a Likert scale where 1 = item is not a priority for action, 2 = item is a fair priority for action, 3 = item is a priority for action, and 4 = item is a top priority for action. See Figure 2 for an excerpt of the instrument.

Psychometric testing of the PIPGAI was conducted using a panel of 8 nursing content experts. The I-CVI results are presented by Donabedian domains in Tables 1 to 4. Two items were deleted due to CVI scoring below 0.70 (score of 0.62 each). Three items were revised due to scoring between 0.71 and 0.75, and all other items ranged from 0.875 to 1.0. Total S-CVI score was 0.95, indicating excellent content validity. Reliability was determined by research team members independently collecting data and completing the gap analysis instrument. The interrater reliability of the two expert research team members (clinical and system expert) was moderate with a Cronbach alpha of 0.53. The percentage of agreement across all 3 of the data collectors varied from 62% to 79%. Percentage of agreement for nursing student and clinical expert was 62% (48 out of 78), with no significant association between responses (Fisher exact test, $P = .2657$). However, percentage of agreement for the clinical expert and system expert was 77% (60 out of 78), with a significant association between responses (Fisher test, $P = .0017$). The highest percentage of agreement was 79% (62 out of 78) observed between the nursing student and the system expert, with a significant association between responses (Fisher test, $P = .0001$). Using a modified Delphi approach, the items where disagreement was present were discussed and responses of the research team members were summarized, until 100% consensus of agreement was achieved.

Aim 3: Gap Analysis

Using the revised PIPGAI, a gap analysis of PIPM practices in the level I academic acute care hospital was conducted, resulting in a total score of 267 of 553 (48%), This score indicates significant gaps in current PIPM practices. Each evidence-based practice item was

PRESSURE INJURY PREVENTION GAP ANALYSIS INSTRUMENT							
A	B	C	D	E	F	G	H
Best Practices/Standards of Care	**Content present?**	**Level of detail?**	**Content Location?**	**Ease of use?**	**Comments**	**Key Stakeholder Rating of Priorities**	**Individual Item Total**
Please indicate if the following practices are in place: content, level of detail, content location and ease of use.	**NO = 0 YES = 1**	**None= 0 Minimal= 1 Moderate=2 Comprehensive=3**	**EHR= 1, Intranet= 2, Policy/protocol= 3, Quality site= 4, Human Resources=5, Educator= 6, Other= 7**	**Accomplished easily= 1; Requires a notable degree of effort= 2; Difficult to accomplish= 3**		**Prioritize item** for action: 1. Item is not a priority; 2. Item is a fair priority; 3. Item is a priority; 4. Item is a top priority	**Add B+C+E SCORE FOR EACH ITEM**
Structure							
Leader Engagement							
1. Leadership health professionals are involved in oversight and implementation of PIP Program.							
2. Evidence of clinical leadership in a QI program(s) related to PIP/treatment							
EHR-Standardized tools							
3. Clinical decision support tools are evident- Electronic health record (EHR) supports PIP- Design, reports (aggregate, individual, real-time)							
4. EHR-Standardized tools to support determining POA and staging accuracy.							
5. EHR interface with technology- such as skin assessment technology (i.e., SEM, thermography), wound assessment (software), reminder systems (repositioning).							
Education and Onboarding- system level							
6. A plan for PI education, skills training and psychosocial support to individuals with or at risk of PI.							
7. Assessment of Pressure injury knowledge of health professionals is conducted							
8. A structured, tailored multifaceted PI Quality improvement program is in place							
9. Staff receive regular education in PIP and treatment					Indicate when staff education is provided: Orientation=1, Unit-based=2 , As needed=3		
Resources- Equipment/technology							
10. Clinical decision support tools are evident- Electronic health record (EHR) supports PIP- Design, reports (aggregate, individual, real-time)							
11. Quality equipment and standards for its use are available for patients and staff (support surfaces- overlay, rental bed/surface, seat cushions, heel boots, prophylactic dressings, technology- SEM, thermography, photography, pressure mapping, positioning systems).							
12. Process to support quality equipment (OR, ED, Unit)- maintenance, purchase, rental							
13. EBP Power plan (order set) on PIP and treatment							
14. Clinical support tools to promote PIP and treatment are available (Procedures, resources, equipment)							
People- Expertise/staffing							
15. Assessment and maximization of Workforce characteristics (expertise, knowledge) are a part of a QI plan to reduce PI							

Figure 2. Pressure Injury Prevention Gap Analysis Instrument excerpt image. ED indicates emergency department; EBP, evidence-based practice; OR, operating room; PI, pressure injury; PIP, pressure injury prevention; POA, present on admission, QI, quality improvement; SEM, sub-epidermal moisture measurement.

rated according to content present, level of detail, and ease of use. Fifty-eight of 70 evidence-based practice items (73%) had content present and 64% (37 of 58) items had minimal detail, and 62% (n = 36) were difficult or required notable effort to accomplish. In addition, 50 of 79 items (63%) achieved a total score of 4 or less and were identified as gaps.

Priority rating mean scores are summarized in Table 5. The three highest priority rating evidence-based PI practices were (1) quality equipment and standards for its use are available for patients and staff, (2) immediate access to clinical decision support tools in the electronic medical records, and (3) standardized resources to support determining PIs present on admission and staging accuracy.

In addition to analyzing the priority rating scores by all Council members, priority rating mean scores were also compared according to the Council member characteristic of direct or non–direct care. Priority rating mean scores for all items in the structure and process domains were not statistically different between direct care (n = 6) and non–direct (n = 8) council members. In contrast, 2 items in the outcome domain were rated as significantly higher priority by the non–direct care group. They were appropriate use of feedback and reminder systems to promote the QI program and outcomes to stakeholders ($P = .017$, $P = .004$).

TABLE 1.
PIPGAI CVI by Donabedian Domains

Domain Items	Mean	CVI
Structure items	3.823	0.96
Process items	3.765	0.94
Outcome items	3.77	0.95
Total S-CVI	3.786	0.95

Abbreviations: CVI, content validity index; S-CVI, total scale—content validity index.

DISCUSSION

Prevention and management of PIs is a complex patient safety issue; nevertheless, healthcare organizations must

TABLE 2.
PIPGAI I-CVI Structure Domain Items

	Rated 1 Or 2	Rated 3 or 4	Item CVI
Leadership health professionals are involved in oversight and implementation of PIP Program.	0	8	1.0
Evidence of clinical leadership in a QI program(s) related to PIP/treatment.	0	8	1.0
Clinical decision support tools are evident—electronic health record (EHR) supports PIP—design, reports (eg, aggregate, individual, real time).	0	8	1.0
EHR—standardized tools to support determining POA and staging accuracy.	0	8	1.0
A plan for PI education, skills training, and psychosocial support to individuals with or at risk of PI.	0	8	1.0
Assessment of pressure injury knowledge of health professionals is conducted.	1	7	0.875
A structured, tailored multifaceted PI quality improvement program is in place.	0	8	1.0
Staff receive regular education in PIP and treatment.	0	8	1.0
Clinical decision support tools are evident—electronic health record (EHR) supports PIP—design, reports (eg, aggregate, individual, real time).	0	8	1.0
Quality equipment and standards for its use are available for patients and staff (eg, support surfaces—overlay, rental bed/surface, seat cushions, heel boots, prophylactic dressings, technology—SEM, thermography, photography, pressure mapping, positioning systems).	0	8	1.0
Process to support quality equipment (OR, ED, unit): maintenance, purchase, rental.	1	7	0.875
EBP power plan (order set) on PIP and treatment is available in EHR.	0	8	1.0
Clinical support tools to promote PIP and treatment are available (eg, procedures, resources, equipment).	1	7	0.875
Assessment and maximization of workforce characteristics (expertise, knowledge) are a part of a QI plan to reduce PI.	1	7	0.875
Assessment of appropriate workforce staff workforce characteristics (staffing levels and skill mix) to ensure that quality of care is provided.	1	7	0.875
Specialized health professional(s) are available to support PIP and treatment.	0	8	1.0
PI rate (incidence and/or prevalence) is regularly conducted and reported to key stakeholders.	0	8	1.0
Assessment of workforce attitudes and cohesion to facilitate implementation of PI QI program is conducted.	3	5	0.62
Accountability is fostered through a culture of safety (ie, root cause analysis—leadership, manager, direct care RN, provider).	0	8	1.0
High-reliability strategies are incorporated into the culture of safety throughout the organization.	0	8	1.0
A tailored, structured, and multifaceted quality improvement program to reduce the incidence of PI has been developed and implemented.	0	8	1.0
Key stakeholders are engaged in oversight and implementation of the QI program to reduce PI.	0	8	1.0
Evidence-based policies, procedures and protocols, and standardized documentation systems are in place as part of a QI plan to reduce PI.	0	8	1.0

Abbreviations: CVI, content validity index; EBP, evidence-based practice; I-CVI, individual-content validity index; OR, operating room; PI, pressure injury; PIP, pressure injury prevention; POA, present on admission, QI, quality improvement; RN, registered nurse; SEM, sub-epidermal moisture measurement.

continue to strive for excellence and minimize development of hospital-acquired PI. In order to accomplish this goal, healthcare organizations must assess and continue to improve the safety of care they provide. Performing a gap analysis of evidence-based PI practice is one technique for accomplishing this goal.[10] The persistence of PIs that develop in healthcare facilities demands attention and identification of practice gaps by multidisciplinary key stakeholder engagement. The challenge also demands a data-driven comparison of organizational prevention and management strategies to current best evidence. Engaging key stakeholders in the gap analysis research design, procedures, and findings was crucial for accomplishing the objectives of this study. The goal of key stakeholder engagement incorporated into our study design is congruent with WOCN Society's mission of a patient-centric approach[33] and PCORI's mission to leverage key stakeholder expertise to promote research that is more patient-centered, relevant, and useful, and with greater uptake of the findings within the organization.[11]

To facilitate key stakeholder engagement, the PAR approach was used as a guiding framework. The Council development and engagement promoted reciprocal relationships defining the roles of all key stakeholders as collaborators, sharing and colearning, while building trust through transparency and honesty in communication. The study design incorporated key stakeholder roles, expertise, and perspectives in the spectrum of PI management and prevention from the point of care to support services. Key stakeholders were invited to participate in the study, and the Council methods ensured authentic, meaningful, and robust engagement to promote sustainability and nurse capacity building. Through the work of the Council (literature review, appraisal, focused mapping, and instrument development), there is broad applicability across a variety of settings and potential research designs.

One area of application was in the methodology. Many studies report consumer or key stakeholder engagement, but we assert that few report the rigorous methodology similar to

TABLE 3.
PIPGAI I-CVI Process Domain Items

	Rated 1 or 2	Rated 3 or 4	Item CVI
A pressure injury risk assessment to conduct and document as soon as possible after admission/transfer/change in condition/and periodically thereafter.	0	8	1.0
Individuals with Braden Scale score of <18 are considered at risk for PI. Subscale scores are considered when developing preventive interventions.	1	7	0.875
Other risk factors are considered when determining risk of PI—age, history, or presence of PI, pain, diabetes mellitus, poor tissue perfusion, oxygen deficits, increased body temperature, laboratory values, mental health, prolonged surgical time, ASA score (OR), prolonged critical care LOS, mechanical ventilation, vasopressor use, APACHE II score, presence of medical devices.	0	8	1.0
Health-related quality of life (HRQOL), knowledge, and self-care skills of individuals with or at risk of PI are used to facilitate development of a patient's PI care plan and education program.	1	7	0.875
Individualized risk-based care plan is developed and documented for those with a PI.	0	8	1.0
A risk assessment is conducted—using a structured approach, including comprehensive assessment, supplement use of a risk assessment tool with assessment of additional risk factors, interpret using clinical judgment.	1	7	0.875
Education is provided to patient/caregiver regarding PIP, self-care skills training, and psychosocial support.	1	7	0.875
Skin assessment daily (q shift, or per standard).	0	8	1.0
Inspect skin of individuals at risk of PI to identify presence of integrity, erythema, temperature, edema, and change in tissue consistency.	0	8	1.0
Conduct a comprehensive skin assessment as soon as possible after admission/transfer and periodically thereafter and document.	0	8	1.0
Implement a skin-care regimen that includes skin health, ph neutral soap, moisture barriers, and moisturizer.	1	7	0.875
Use of technology for routine skin assessment is available—SEM, thermography, photography.	2	6	0.75
For darkly pigmented skin, thermography and/or SEM is available and used as adjunctive technologies.	1	7	0.875
Assess and document PI at least weekly and monitor progress.	1	7	0.875
PIP includes process for repositioning routinely, quality of the turn off sacrum, use of positioning aids to redistribute pressure/shear, preventive dressings on sacrum and heels and under medical devices, and use of support surface overlay and/or cushion.	1	7	0.875
Appropriate support surface is individualized to patient needs—weight, width, moisture.	0	8	1.0
Use high-specification reactive single layer foam mattress of overlay for those at risk of PI.	2	6	0.75
Relative benefits of using an alternating air mattress/overlay for those at risk of PI are included in the decision making of choice of surface.	1	7	0.875
Use a pressure redistribution support surface on the OR table for all those at risk of PI.	0	8	1.0
Individualized treatment plan and goal is available for those with a PI.	0	8	1.0
Positioning reminder systems are present (eg, leaf, pressure mapping, other methods).	1	7	0.875
Plan/process is in place to ensure that heels are free of bed surface—heel boots, wedges, pillows.	0	8	1.0
Prophylactic dressings are used on body locations with increased mechanical load (pressure), including heels, if they cannot be suspended off the bed.	1	7	0.875
A plan for appropriate use of repositioning devices and equipment—lifts, transfer devices, obesity patients, wedges, heel boots, and/or prophylactic dressings—is present.	1	7	0.875
Pain assessment is included for those with a PI and treatment plan if appropriate.	0	8	1.0
A plan to minimize medical device–related pressure injuries (MDRPI) is evident (eg, review risk of PI, regularly monitor tension and position of MD, assess skin under and around MD regularly, alternate type of device).	0	8	1.0
A skin-care regimen is present to promote healthy skin and prevent moisture-associated skin damage (MASD).	0	8	1.0
Skin cleansers to maintain normal skin ph are encouraged. (Avoid use of alkaline soaps and cleansers.)	0	8	1.0
Use of high-absorbency incontinence products to protect skin in individuals at risk of PI and who have urinary incontinence.	0	8	1.0
PI prevention plan includes protecting skin from moisture with a barrier product.	0	8	1.0
Nutritional screening and comprehensive assessment are initiated for those at risk of PI.	0	8	1.0
An individualized nutrition care plan for those with or at risk of PI is part of the PI program.	0	8	1.0
A plan to optimize energy intake and protein for those who are malnourished or at risk of malnourishment is part of the PI prevention program.	0	8	1.0

(*continues*)

TABLE 3.
PIPGAI I-CVI Process Domain Items (*Continued*)

	Rated 1 or 2	Rated 3 or 4	Item CVI
A plan to provide 30-35 kcal/kg/d and 1.2-1.5-g protein for those with a PI or who are malnourished or at risk of malnourishment is part of the PI prevention program.	0	8	1.0
A plan to offer high-calorie, high-protein fortified foods and/or nutritional supplements in addition to the usual diet for those at risk of PI and malnourished is part of the PI prevention program.	0	8	1.0
A plan to provide high-calorie, high-protein, arginine, zinc, and antioxidant oral nutritional supplements or enteral formula for those with stage 2 or greater PI is a part of the PI prevention program.	0	8	1.0
Goals of care are considered when choosing enteral or parenteral feeding for those who cannot meet the nutritional requirements through oral intake.	0	8	1.0
A plan to provide/encourage adequate water/fluid intake for hydration for those with or at risk of PI is part of the PI prevention program.	0	8	1.0
Conduct age-appropriate nutritional screening/assessment for neonates and children, and consideration of fortified foods, age-appropriate supplements, or enteral/parenteral nutritional support is part of the PI prevention program.	0	8	1.0
Communication strategies are present for shift change and when transferring between units at admission, surgery/procedures, and discharge.	1	7	0.875
HRQOL, knowledge, and self-care skills of individuals with or at risk of PI are used to facilitate development of a patient's PI care plan and education program.	3	5	0.62
A plan for PI education, skills training, and psychosocial support to those with or at risk of PI is present.	0	8	1.0

Abbreviations: APACHE II indicates Acute Physiology and Chronic Health Evaluation II; ASA, American Society of Anesthesiology; CVI, content validity index; EBP, evidence-based practice; LOS, length of stay; MD, medical device; OR, operating room; PI, pressure injury; PIP, pressure injury prevention; POA, present on admission, QI, quality improvement; SEM, sub-epidermal moisture measurement.

that employed in our study. Ilesanmi and colleagues[34] used a Delphi approach to review 2014 Pressure Ulcer Prevention Clinical Practice Guidelines[20] for feasibility of adoption in Nigerian hospitals. They reported that including key stakeholders enhanced successful adoption guideline best practices. Haesler and colleagues[35] provided important information regarding consumer engagement (n = 1233) from 27 countries achieved in the 2019 Prevention and Treatment of Pressure Ulcers/Injuries: Clinical Practice Guideline. They described how they incorporated findings of an online survey, and the inclusion of consumer perspectives (consumers in this study comprised persons at risk for or with a PI) was incorporated into the guideline development.[35] These efforts provide a standard for future guideline and instrument development.

Another area of application related to methodology is the integration of PAR and key stakeholders. Only 4 of 719

TABLE 4.
PIPGAI I-CVI Outcome Domain Items

	Rated 1 or 2	Rated 3 or 4	Item CVI
A rigorous methodological design and consistent measurement variables are used when conducting and reporting PI.	0	8	1.0
Point prevalence conducted quarterly or monthly.	0	8	1.0
Facility-acquired rate is conducted quarterly or monthly.	0	8	1.0
Regularly monitor, analyze, and evaluate performance against quality indicators for PIP/treatment.	1	7	0.875
Communication strategies are present for shift change and when transferring between units at admission, surgery/procedures, and discharge.	0	8	1.0
Documentation process is present for appropriate identification, stage, and location of a PI performed by provider and/or designated wound care nurse expert.	1	7	0.875
A plan for appropriate provider identification of timing of PI development (present on admission or hospital-acquired) and appropriate documentation is present.	0	8	1.0
Appropriate coding processes (eg, clarification and queries and *ICD-10*) are in place to ensure correct PI classification.	0	8	1.0
Education/training is provided to providers related to identifying/assessing PI, appropriate staging, timing of PI development documentation, and accurate *ICD-10* codes and documentation.	0	8	1.0
Appropriate use of feedback and reminder systems to promote the QI program and outcomes to stakeholders is present.	0	8	1.0
Communication strategies (eg, rounding, internal communication boards, flyers, committee reporting, electronic technology) are present to provide outcome data to units, key stakeholders, and leadership.	0	8	1.0
Relevant HCAHPS scores are examined to improve PI prevention.	2	6	0.75
Communication process with key stakeholders is present.	1	7	0.875

Abbreviations: CVI, content validity index; HCAP, Hospital Consumer Assessment of Healthcare Providers and Systems; *ICD-10*, *International Classification of Diseases, Tenth Revision*; PI, pressure injury.

TABLE 5.
Pressure Injury Practice Gaps Priority for Action Rating (Highest to Lowest)

Evidence-Based Standards of Care	Structure Process Outcomes	Key Stakeholder (n = 14) Priority Rating Scores,Mean (SD)	Direct Care (n = 6) Priority Rating Scores, Mean (SD)	Non–Direct Care (n = 8) Priority Rating Scores, Mean (SD)
11. Quality equipment and standards for its use are available for patients and staff (support surfaces—overlay, rental bed/surface, seat cushions, heel boots, prophylactic dressings, technology—SEM, thermography, photography, pressure mapping, positioning systems).	Structure	3.5 (0.855)	3.5 (0.548)	3.6 (1.13)
03. Clinical decision support tools are evident—electronic health record (EHR) supports PIP—design, reports (aggregate, individual, real time).	Structure	3.5 (0.760)	3.7 (0.516)	3.6 (0.787)
04. EHR—standardized tools to support determining POA and staging accuracy.	Structure	3.5 (0.855)	3.7 (0.516)	3.4 (1.13)
67. A rigorous methodological design and consistent measurement variables are used when conducting and reporting PI.	Outcomes	3.4 (0.745)	3 (0.632)	3.7 (0.756)
40. Appropriate support surface is individualized to patient needs—weight, width, moisture.	Process	3.4 (0.745)	3.2 (0.753)	3.6 (0.787)
58. A plan to provide 30–35 kcal/kg/d and 1.2- to1.5-g protein for those with a PI or who are malnourished or at risk of malnourishment is part of the PI prevention program.	Process	3.4 (0.929)	3.2 (0.753)	3.6 (1.13)
01. Leadership health professionals are involved in oversight and implementation of PIP program.	Structure	3.4 (0.756)	3.3 (0.516)	3.7 (0.756)
20. Accountability is fostered through a culture of safety (ie, root cause analysis—leadership, manager, direct care RN, provider).	Structure	3.4 (0.842)	3.3 (0.516)	3.4 (1.13)
22. A tailored, structured, and multifaceted quality improvement program to reduce the incidence of PI has been developed and implemented.	Structure	3.4 (0.842)	3.3 (0.516)	3.4 (1.13)
56. An individualized nutrition care plan for those with or at risk of PI is part of the PI program.	Process	3.4 (0.756)	3.3 (0.816)	3.6 (0.787)
57. A plan to optimize energy intake and protein for those who are malnourished or at risk of malnourishment is part of the PI prevention program.	Process	3.4 (0.938)	3.3 (0.816)	3.6 (1.13)
55. Nutritional screening and comprehensive assessment is initiated for those at risk of PI.	Process	3.4 (0.929)	3.5 (0.837)	3.3 (1.11)
06. A plan for PI education, skills training, and psychosocial support to individuals with or at risk of PI.	Structure	3.3 (0.825)	3.2 (1.17)	3.4 (0.535)
59. A plan to offer high-calorie, high-protein fortified foods and/or nutritional supplements in addition to the usual diet for those at risk of PI and malnourished is part of the PI prevention program.	Process	3.3 (0.914)	3.2 (0.753)	3.4 (1.13)
60. A plan to provide high-calorie, high-protein, arginine, zinc, and antioxidant oral nutritional supplements or enteral formula for those with stage 2 or greater PI is a part of the PI prevention program.	Process	3.3 (0.914)	3.2 (0.753)	3.4 (1.13)
51. A skin care regimen is present to promote healthy skin and prevent moisture-associated skin damage (MASD).	Process	3.3 (0.825)	3.3 (0.516)	3.3 (1.11)
70. Regularly monitor, analyze, and evaluate performance against quality indicators for PIP/treatment.	Outcomes	3.2 (0.699)	2.8 (0.408)	3.6 (0.787)
07. Assessment of pressure injury knowledge of health professionals is conducted.	Structure	3.2 (0.579)	3 (0.000)	3.4 (0.787)
25. A pressure injury risk assessment to be conducted and documented as soon as possible after admission/transfer/change in condition/and periodically thereafter.	Process	3.2 (0.893)	3 (0.632)	3.4 (1.13)
61. Goals of care are considered when choosing enteral or parenteral feeding for those who cannot meet the nutritional requirements through oral intake.	Process	3.2 (0.893)	3 (0.632)	3.4 (1.13)
76. Education/training is provided to providers related to identifying/assessing PI, appropriate staging, timing of PI development documentation, and accurate *ICD-10* codes, and documentation.	Outcomes	3.2 (0.699)	3 (0.632)	3.4 (0.787)

(*continues*)

TABLE 5.
Pressure Injury Practice Gaps Priority for Action Rating (Highest to Lowest) (*Continued*)

Evidence-Based Standards of Care	Structure Process Outcomes	Key Stakeholder (n = 14) Priority Rating Scores,Mean (SD)	Direct Care (n = 6) Priority Rating Scores, Mean (SD)	Non–Direct Care (n = 8) Priority Rating Scores, Mean (SD)
17. Specialized health professional(s) are available to support PIP and treatment.	Structure	3.2 (0.802)	3.2 (0.408)	3.3 (1.11)
35. Implement a skin-care regimen that includes skin health, ph neutral soap, moisture barriers, moisturizer.	Process	3.2 (0.893)	3.2 (0.753)	3.3 (1.11)
62. A plan to provide/encourage adequate water/fluid intake for hydration for those with or at risk of PI is part of the PI prevention program.	Process	3.2 (0.975)	3.2 (0.753)	3.3 (1.25)
21. High-reliability strategies are incorporated into the culture of safety throughout the organization.	Structure	3.2 (0.893)	3.3 (0.516)	3.3 (1.11)
31. Education is provided to patient/caregiver regarding PIP, self-care skills training, and psychosocial support.	Process	3.2 (1.12)	3.3 (1.21)	3.1 (1.22)
74. Appropriate coding processes (clarification and queries and *ICD-10*) are in place to ensure correct PI classification.	Outcomes	3.1 (0.730)	2.7 (0.516)	3.4 (0.787)
10. Clinical decision support tools are evident—electronic health record (EHR) supports PIP—design, reports (aggregate, individual, real time).	Structure	3.1 (0.829)	2.8 (0.753)	3.4 (0.787)
18. PI rate (incidence and/or prevalence) is regularly conducted and reported to key stakeholders.	Structure	3.1 (1.03)	2.8 (0.753)	3.6 (1.13)
16. Assessment of appropriate workforce staff workforce characteristics (staffing levels and skill mix) to ensure that quality of care is provided.	Structure	3.1 (0.730)	3 (0.894)	3.1 (0.690)
44. Individualized treatment plan and goal is available for those with a PI.	Process	3.1 (0.829)	3.2 (0.753)	3 (1.00)
53. Use of high-absorbency incontinence products to protect skin in individuals at risk of PI and who have urinary incontinence.	Process	3.1 (0.864)	3.2 (0.753)	3.1 (1.07)
02. Evidence of clinical leadership in a QI program(s) related to PIP/ treatment.	Structure	3.1 (0.770)	3.5 (0.548)	3 (0.816)
68. Point prevalence conducted quarterly or monthly.	Outcomes	3 (0.784)	2.7 (0.516)	3.4 (0.787)
69. Facility-acquired rate is conducted quarterly or monthly.	Outcomes	3 (0.784)	2.7 (0.516)	3.4 (0.787)
37. For darkly pigmented skin, skin temp and SEM are available and used as adjunctive technologies.	Process	3 (1.04)	2.8 (1.17)	3.1 (1.07)
42. Relative benefits of using an alternating air mattress/overlay for those at risk of PI are included in the decision making of choice of surface.	Process	3 (0.877)	2.8 (0.753)	3.3 (0.951)
19. Assessment of workforce attitudes that support the implementation of PI QI program is conducted.	Structure	3 (0.679)	3.2 (0.753)	3 (0.577)
79. Communication process with key stakeholders is present.	Outcomes	3 (0.877)	3.2 (0.753)	3 (1.00)
66. A plan for PI education, skills training, and psychosocial support to those with or at risk of PI is present.	Process	2.9 (0.770)	3 (0.632)	2.7 (0.951)
75. Readmission rates/statistics are evaluated routinely to support PI QI.	Outcomes	2.9 (0.829)	3 (0.632)	3 (1.00)
78. Communication strategies (eg, rounding, internal communication boards, flyers, committee reporting, electronic technology) are present to provide outcome data to units, key stakeholders, and leadership.	Outcomes	2.8 (0.802)	2.2 (0.408)	3.3 (0.756)
50. A plan to minimize medical device–related pressure injuries (MDRPI) is evident (eg, review risk of PI, regularly monitor tension and position of MD, assess skin under and around MD regularly, alternate type of device).	Process	2.8 (0.975)	2.5 (1.05)	3 (1.00)
77. Appropriate use of feedback and reminder systems to promote the QI program and outcomes to stakeholders is present.	Outcomes	2.7 (0.825)	2.2 (0.408)	3.3 (0.756)
45. Positioning reminder systems are present—eg, leaf, pressure mapping, other methods.	Process	2.7 (1.07)	2.8 (0.983)	2.7 (1.25)
65. Is a patient's quality of life, knowledge, and self-care skills assessed when developing a PI care plan and education?	Process	2.7 (0.726)	3 (0.632)	2.6 (0.787)
29. Individualized risk-based care plan is developed and documented for those with a PI.	Process	2.6 (0.852)	2.3 (0.816)	2.7 (0.951)

(*continues*)

TABLE 5.
Pressure Injury Practice Gaps Priority for Action Rating (Highest to Lowest) (*Continued*)

Evidence-Based Standards of Care	Structure Process Outcomes	Key Stakeholder (n = 14) Priority Rating Scores,Mean (SD)	Direct Care (n = 6) Priority Rating Scores, Mean (SD)	Non–Direct Care (n = 8) Priority Rating Scores, Mean (SD)
36. Use of technology for routine skin assessment is available—SEM, thermography, photography.	Process	2.6 (0.842)	2.7 (0.516)	2.6 (1.13)
05. EHR interface with technology—such as skin assessment technology (ie, SEM, thermography), wound assessment (software), reminder systems (repositioning).	Structure	2.6 (1.09)	2.8 (0.983)	2.4 (1.27)
28. Health-related quality of life, knowledge, and self-care skills of individuals with or at risk of PI are used to facilitate development of a patient's PI care plan and education program.	Process	2.5 (0.650)	2.7 (0.516)	2.4 (0.787)

Abbreviations: *ICD-10, International Classification of Diseases, Tenth Revision*; PI, pressure injury; PIP, pressure injury prevention; POA, present on admission, QI, quality improvement; SEM, sub-epidermal moisture measurement.

PCORI studies were identified that reported the use of PAR methods to engage team members. None of the studies were related to PI. However, 1 example was identified as a randomized controlled trial by Ehde and colleagues,[36] in which they collaborated with a national consumer organization to develop and test an intervention to address psychosocial issues in limb loss. These researchers concluded that integration of PAR into intervention research has the potential to advance the goals of the study. The paucity of literature related to PAR and key stakeholder involvement in PI research indicates that this may be a valuable opportunity and methodology to include in future research regarding PIs.

Gap Analysis Approach

The second critical component in this study was a gap analysis approach and development of a valid and reliable instrument (PIPGAI) to identify gaps in evidence-based PI practices. The PIPGAI allows for a standardized and rigorous review of current organizational practices, aligned with current evidence-based practice, to identify practice gaps with priority rating of gap items for action to direct improvement efforts. The PIPGAI can be applied as a method to conduct a needs assessment or incorporated in a performance improvement initiative. Although this study was performed in the United States, the instrument can be applied across geographic, regulatory, and reimbursement boundaries due to the focus on global evidence-based practice related to PIs.[20] In addition, this gap analysis instrument can be used, with minor modification, regardless of the size of the hospital as it reflects evidence-based practice.

There are some studies that report using a gap analysis methodology, but few use a gap analysis method to address PIs or report using a psychometrically tested gap analysis instrument. Investigators at Johns Hopkins Health System[9] report development of a gap analysis tool to examine the current state of inpatient diabetes care; however, there was no discussion of validation or reliability of their tool. Bavuso and colleagues[37] used gap analysis methodology to evaluate current nursing skin and PI data elements in the electronic health record. They identified inconsistencies within and across flow sheet data elements but did not examine actual PI practices or describe the gap analysis tool's validity or reliability. Fourie and colleagues[38] used a gap analysis method to examine prolonged placement in a prone position practices and skin care guidelines. Findings from these studies support the use of the gap analysis method. Our findings are consistent with these studies, but we assert that our work goes further by evaluating the psychometric properties of the gap analysis instrument and providing an objective method to rate gaps and priorities.

We assert that the priority rating for actions of each gap item in our study provides a pragmatic and objective approach to direct future improvement strategies. In addition, we examined the Council members' priority rating scores by the Council member characteristic of direct care or non–direct care. We found that the groups' priority rating scores did not statistically differ across the structure and process items, indicating a similar importance of these items to both groups. Nevertheless, two items in the outcome domain were given statistically higher priority ratings by the non–direct care group. The higher priority rating scores suggest that the non–direct care group may be more aware of the benefits and consequences of outcome measurement, coding, and transparency of data. The direct care group may be more attuned to the support provided to the nurse (structure) and the actual care (process) provided to the patient.

Strengths and Limitations

This study took place during the COVID-19 pandemic (2020-2021), which was both a strength and a limitation. Because of pandemic restrictions, face-to-face Council meetings were limited and we pivoted to virtual meetings that enhanced Council engagement. In addition, the virtual format allowed attendance for members who may not have been able to attend in person. Pandemic restrictions, pandemic effects on the hospital census, and financial constraints caused staff reductions and reallocation to other areas and limited involvement of key clinical direct care nurses. Finally, an important limitation caused by COVID-19 restrictions was the limited involvement of patients and their caregivers. Study strengths included collaboration within the multidisciplinary Council, use of Lean and Six Sigma methods, and retention of the majority of original Council members during the pandemic.

CONCLUSION

This study describes a systems theory, mixed-methods convergent design, and use of PAR methodology to develop a comprehensive and rigorous gap analysis on a priority healthcare issue. The engagement of an interprofessional, collaborative

blend of academic and practice key stakeholders was intentionally integrated into all aspects of the study from planning to conducting the study and then disseminating the results. We assert that the methods described in this study provide a model for key stakeholder engagement, a validated gap analysis instrument, and an objective and pragmatic method to evaluate PIPM practices.

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