Title

Ethnography of Attitudes Towards Pressure Injury Prevention in Critical Care Nurses, Providers, and Patients and Families in Intensive Care Units

Author

Rahimi, Yalda

Publication Date

2019

Peer reviewed|Thesis/dissertation

UNIVERSITY OF CALIFORNIA

Los Angeles

Ethnography of Attitudes Towards Pressure Injury Prevention in Critical Care Nurses, Providers, and Patients and Families in Intensive Care Units

A dissertation submitted in partial satisfaction of the requirements for the degree Doctor of Philosophy in Nursing

by

Yalda Rahimi

2019

ABSTRACT OF THE DISSERTATION

Ethnography of Attitudes Towards Pressure Injury Prevention
in Critical Care Nurses, Providers, and Patients and Families
in Intensive Care Units

by

Yalda Rahimi
Doctor of Philosophy in Nursing
University of California, Los Angeles, 2019
Professor Barbara M. Bates-Jensen, Chair

Background: Pressure injuries (PIs) impose significant human and financial costs on patients and their families and the health care system. Most are considered preventable and therefore are deemed medical errors. Among medical errors, PIs are the costliest. Results from extensive etiology-related and interventional research have been translated into evidence-based clinical guidelines which have been widely disseminated. Yet, hospital acquired pressure injuries (HAPI) have been increasing in recent years while HAPI prevalence rates in intensive care units (ICU) continue being the highest among hospitalized patients. Considering that the majority of PIs are medical errors, researchers and health care organizations have to explore human factors, such as

attitudes of main stakeholders, to inform approaches to decreasing HAPIs in ICU patients who are among the most vulnerable of hospitalized patients.

Methods: A multi-site, focused ethnographic study was conducted with four major stakeholders in the ICU. Critical care nurses (CCRN), physician and nurse practitioner providers, ICU leaders, and patients and their families from two community hospitals and two academic hospitals participated in interviews or focus groups. Semi-structured interview guides were used to elicit implicit and explicit attitudes of each stakeholder group towards PIP.

Results: Findings of three stakeholder groups, CCRNs, providers, and patients and families, are reported here. All participants held preconceptions and misconceptions about PIs and PIP which informed the degree to which they were engaged with PIP processes. Preconceptions and misconceptions affected how they interpreted transition points in the ICU which in turn impacted how they prioritized PIP. Major misconceptions held by both CCRNs and providers were that PIP could not be undertaken with very critical patients, that PIP mostly consisted of side to side turning at various intervals, and that PIs took longer than scientific evidence suggests. Patients' and families' incomplete preconception that affected their attitude toward PIP in the ICU was that PIs only befell frail, bedbound, and debilitated patients in skilled nursing facilities.

The dissertation of Yalda Rahimi is approved

Carol Pavlish

Felicia Hodge

Peyman Benharash

Barbara M. Bates-Jensen, Committee Chair

University of California, Los Angeles

2019

Dedication

It takes a village to raise a child, the saying goes. That also applies to completing a PhD, I understand now. My family is my backbone and my driving force and without their support this milestone would not have been possible. I dedicate this achievement to my dear parents, Parvin and Hamid. I will forever be in your debt. Who I am today is, to a great extent, a product of your love and sacrifices. I also thank my wonderful sisters, Leyla and Aida, whose support and belief in me has been unwavering over the years. Finally and most importantly, I extend my greatest gratitude to my husband, Shahin, and my beautiful daughters, Darya and Bahar. Shahin, you are my guiding star and my safe haven, and there is no cheerleader and motivational speaker grander than you. Thank you for giving me the time and space to complete this degree. My dearest Darya and Bahar. You will forever be the most sacred and significant contribution I have made to this life and to this world. All else fades in comparison.

Table of Contents **Page Number**

List of Acronyms

Name	Acronym
Intensive Care Unit	ICU
Pressure Injury	PI
Pressure Injury Prevention	PIP
Hospital Acquired Pressure Injury	HAPI
Registered Nurse	RN
Critical Care Nurse	CCRN
Nurse Practitioner	NP
Nursing Assistant	NA
Licensed Vocational Nurse	LVN
Medical Doctor	MD
Physician Assistant	PA
Acute Respiratory Distress Syndrome	ARDS
Attitude Toward Pressure Ulcer Prevention	APuP
Pressure Ulcer Knowledge Test	PUKT
Health-Related Quality of Life	HRQL

List of Tables

Chapter 1

Chapter 2

Chapter 3

List of Figures

Chapter 1

Chapter 2

Chapter 3

Acknowledgments

My sincere gratitude goes to my doctoral committee for their support and guidance over the years. It has been a privilege to work with you and to learn from you. I would like to acknowledge Barbara Bates-Jensen, Ph.D. for her inspiring enthusiasm and dedication to bringing awareness to a topic that deserves all our attention - pressure injuries.

Finally, I want to acknowledge the Dissertation Fellowship Year award for supporting my research interests.

Yalda Rahimi, MSHA, RN-BSN, PHN, BA

EDUCATION

Veterans Affairs Quality Scholar Fellow 2014-2016

Jonas Veterans Healthcare Program Scholar 2015-2016

Bachelor of Science in Nursing 2010
California State University, Northridge

Master of Science in Health Administration 2007
California State University, Northridge

Bachelor of Arts in Biology 2004
California State University, Northridge

EXPERIENCE

University of California, Los Angeles 2012-2017
Teaching Assistant for Bachelor's and Master's Nursing Programs
Fundamentals in Medical Surgical Nursing
Health Policy
Psychiatric Mental Health Nursing
Health Care Systems and Organizations

VA Greater Los Angeles Health Care System 2009-2012
Critical Care Registered Nurse: Cardio-thoracic ICU; Medical-Surgical ICU; Step-Down ICU/PCU
Critical Care Float
Committees: Falls Prevention; Commodities; Pressure Ulcer Prevention

California State University, Northridge 2010
Part-time faculty, Department of Health and Human Services

Service Operations Supervisor/Business Analyst 2006-2008
Coventry Health Care, Inc.

Operations Specialist 2000-2006
Functional Restoration Medical Center, Inc.

GUEST LECTURES AND PROFESSIONAL PRESENTATIONS

Quality and Safety Patient Institute 2015

- *Quality Improvement Initiatives for Pressure Ulcer Prevention: Findings from a National Survey of VA Acute Care Hospitals*. Rahimi, Yalda
- *Introduction to the Model for Improvement: Analyzing the Process, Gathering Baseline Data, & Defining AIMS.* Rahimi, Yalda; Lam, Christine; Raja, Pushba 2015
- *Identifying quality improvement opportunities during ICU rounding at the Greater Los Angeles VA*. Rahimi, Yalda; Lam, Christine 2014

Portal of the Association of American Medical Colleges 2014
Multimedia Presentation via MedEd
Introduction to Cognitive Errors. Resource ID: 4085; Rahimi, Yalda; Lam, Christine; Raja, Pushba, Hurley, Brian

UCLA Nursing Theory Development N206 2014
Journaling in Theory Development

UCLA Social Justice and Ethics N10 2014
Ethical Dilemma and Assertiveness

UCLA Social Justice and Ethics N10 2013
Ethical Dilemma and Assertiveness

Chapter 1: Major Stakeholders' Attitudes Toward Pressure Injury Prevention in Intensive Care Units – A Literature Review

Objective: To elucidate the attitudes of major stakeholders regarding pressure injury prevention (PIP) in intensive care units (ICUs).

Background: Pressure injuries (PIs) continue to be a resource-intensive clinical and economic phenomenon that impacts 2.5 million patients in acute care hospitals annually in the United States (US). ICU patients are a particularly vulnerable segment of this population who disproportionately suffer from PIs. In spite of numerous interventional studies and evidence-based clinical guidelines, incidence rates remain variable and high. Most studies and guidelines have focused on nursing and on educational interventions. Few studies have examined and compared the attitudes of multiple stakeholders regarding PIP. None have examined the attitudes of the four major stakeholders: critical care nurses (CCRN), ICU providers (physicians, physician assistants, nurse practitioners), ICU leaders, and patients and their families.

Methods: A systematic review was performed on English language literature, limited to human subject research conducted in inpatient settings without participant age restriction, 1999 to 2019, using PubMed, PsycInfo, the Cumulative Index in Nursing and Allied Health Literature (CINAHL).

Results: Twenty-two studies were identified to meet the inclusion criteria. Only six were conducted within the US. Fourteen were conducted with nurses, four with providers, none with ICU leaders, four with patients, and none with families/caregivers. Of these, only two studies were explicitly and solely conducted with ICU staff. The literature revealed that most nurses reported a positive attitude regarding PIP. Other nurses reported attitudes and routinely missed patient care which could be detrimental to effective PIP. Physicians reported a positive attitude

regarding PIP, but were not adequately prepared to perform prevention tasks. Yet, some providers held positions teaching PIP. The literature further shows that patients have expressed frustration with and disengagement from the health care team. They also reported that human interaction and advocacy helped them to be motivated and to be actively engaged.

Conclusion: The state of the science indicates a glaring gap in the literature on attitudes regarding PIP for CCRNs, ICU providers, leaders, and patients and their families. In-depth and generative research is needed to elucidate the attitudes of these stakeholders which cannot be gained from surveys. Participants in future studies must be explicitly and solely from the ICU environment to learn about attitudes relevant within this context.

Keywords: pressure ulcer, pressure injury, pressure sore, decubitus combined with nurse or physician or physician assistant or provider or nurse practitioner or caregiver and patient combined with attitude.

Introduction

National health expenditures have been steadily increasing from $27.4 billion in 1960 to $3.5 trillion in 2017, consuming 17.9 percent of the gross domestic product. A better understanding of the resource intensive elements that can be modified must become a priority.[1] One such modifiable element is pressure injuries (PIs). The Joint Commission estimates that 2.5 million patients in the US acute care hospitals are treated for PIs each year, and this number is likely to increase as the population ages.[2] Although the rate for hospital acquired conditions has decreased eight percent from 2014 to 2016, the rate for hospital acquired pressure injuries (HAPI) has increased.[3] Indeed, the HAPI rate may be even substantially higher than commonly reported according to recent studies.[4] PIs impact quality of life and increase length of stay, cost, and mortality with more than 60,000 Americans dying each year as a direct result.[5] PI related

lawsuits are the second most common claim after wrongful death[6]. The majority of PIs are deemed preventable which means that most PIs are considered medical errors.[7,67-70] Among medical errors, PIs are associated with the largest annual measurable cost of $3,858 million.[7]

The critically ill patient is at a heightened risk compared to other acute care patients. ICUs provide complex care, invasive devices, and procedures that are not performed in other settings. HAPI rates in ICUs are the highest among all hospitalized patients ranging from 14 percent to 43 percent. [8-12] This trend persists in spite of well-established evidence-based guidelines, various forms of technologies assisting in PIP and a plethora of interventional studies.[13-17] Some have suggested because of the challenging nature of critical care patients, clinical practice guidelines are not comprehensive enough to address the needs of the ICU.[18]

Thus far, most research has focused on the effectiveness of risk assessment, equipment, reduction of friction and shear, and nutrition.[19-22] Additional research has focused on nurses' education and knowledge of PIP, but improved knowledge has not been linked consistently with improved care.[19,23-28] PIP is a complex and multi-factorial phenomenon. Health care organizations and researchers must assess whether other primary variables are at play that should be explored before returning to further interventional studies which tend to yield similar PI rates in ICUs. The fact that most PIs are deemed medical errors indicates that human behavior should be considered as a strong predictor. The behaviors of stakeholders in PIP are presumed to be predicted by their attitudes. Studies in other fields have found that values can affect a person's attitude and behavior such that they have an observable behavioral pattern that is consistent with their values.[29-33] Consequently, eliciting the value that nurses place on PIP may shed new light on their attitudes and behaviors.

The aim of this literature review is to identify and synthesize research studies examining the attitude of four major stakeholders regarding PIP and skin health in ICUs. The stakeholders are CCRNs, ICU providers, ICU leaders, and ICU patients and their families.

Methods

Iterative literature searches were conducted on health care and scientific databases. PubMed, Cumulative Index of Nursing and Allied Health Literature (CINAHL), PsycInfo were searched with the following keywords: pressure ulcer, pressure injury, pressure sore, decubitus combined with nurse or physician or physician assistant or provider or nurse practitioner or caregiver or patient combined with attitude. The search was limited to English language, human subjects research, from 1999 to 2019 with additional auto-alerts set up for notification of additional relevant research articles. To supplement the original search, the reference lists and bibliographies of retrieved articles were reviewed to discover potentially relevant articles not identified in the electronic search. In addition, related work published by the researchers was analyzed for relevance. A description of the literature search is found in Table 1.

Inclusion/Exclusion Criteria

Although the aim of the study was to elucidate the attitudes of major stakeholder groups regarding PIP in ICUs, the literature search revealed that limiting the search to studies conducted in ICUs severely restricted the number of results and yielded zero returns for providers. While we aimed to study CCRN attitudes, only one relevant study was found using that term.[34] Therefore, we expanded to registered nurse (RN). For the registered nurse group, articles were reviewed if the study included inpatient participants discussing their attitudes towards PIP regardless of the unit. Any articles discussing provider, leader, or patient and family attitudes regarding PIP were reviewed for relevance.

Additionally, although the aim of the study was to limit studies with CCRNs that were conducted within the US, applying this limitation severely diminished the results for this stakeholder group. The rationale for this preference is that nursing education and working conditions for nurses differ in the US.[35-40] Hence, synthesizing the literature on attitudes of nurses in other countries with those in the US may not present an accurate account of the phenomenon. Foreign educated nurses from Nigeria and the Philippines, for example, report shocking workplace realities in the US, such as higher patient acuity, demanding patients, high-tech equipment, expanding responsibilities, and workflow differences. These nurses also expressed the need for more professional and cultural education once joining the American workforce.[38] Hence, studies conducted in developed countries in Western Europe and Australia, where nursing education has been shown to be similar to that in the US, were included.

Studies that discussed stakeholder attitudes regarding PIP or other patient safety outcomes were reviewed. Because the term attitude is not always used in studies where it may be explored, studies which met the following definition of attitude were included: attitude is a psychological tendency expressed by evaluating a particular phenomenon with some degree of approval or disapproval.[41]

Finally, only studies were reviewed where participant stakeholder voices were clearly discernible. When voices were combined, neither similarities nor differences between stakeholder groups could be determined.

The literature search identified 253 articles of interest. An additional four were found by searching references and bibliographies. Duplicates (n=152) were excluded and the remaining 105 abstracts were screened for eligibility. An additional 44 articles were removed because they were duplicates, were not conducted in acute care hospitals for the stakeholder group of nurses

and providers, did not include any of the stakeholder groups, studies were not conducted in the US, Western Europe, or Australia, did not relate to PIs, or did not discuss attitudes. Full text articles of the remaining 61 manuscripts were assessed for eligibility. An additional 39 articles were removed for the above reasons in addition to stakeholders' voices not being discernible. The remaining 22 articles were abstracted and included in the review. Search method and selection process are also outlined in Figure 1.

Findings

Of the 22 studies identified and included in this review, the majority, 14, were studies conducted with nurses. Four studies involved providers who, without exception, were medical doctors (MDs). No studies were found examining attitudes of ICU leaders regarding PIP. Four studies were identified that explored patients' perspectives on PIs. No studies explored ICU patients' perspectives. Out of the 22 studies, 16 were conducted outside the US in Sweden, Ireland, Wales, Belgium, Netherlands, United Kingdom (UK), and Australia.[19,28,34,42-51] Systematic reviews covered multiple countries or did not specify countries.[52,53]

Surveys were the most frequently used research method (N=11) to gather data.[24,34,42,44,46,48,54-58] A qualitative design was employed six times.[19,46,47,49,50,59] Psychometric evaluations and systematic reviews were used two times each.[43,45,52,53] A mixed design, which included observations, interviews, and chart reviews was employed once.[51] ICU was mentioned as one of the settings in six studies.[19,24,34,44,54,55]

General findings and characteristics of all studies included in this review are presented in Table 1. A review of findings for each stakeholder group follows.

Nurses' (RNs) Attitudes Toward Pressure Injury Prevention

Of the 14 studies reviewed that investigated nurses' attitudes, ten were conducted outside of the US; five were conducted in Sweden and one in each of the following countries: Australia, Wales, Ireland, Belgium, and one in both Belgium and the Netherlands. Five studies indicated that ICU nurses were among the participants although none specified what percentage of the total sample was from the ICU.[19,24,48,54,55] Only one study explored the attitudes of CCRNs.[34]

Seven studies used a survey only [34,42,46,48,55,58] and one study used a survey and observation.[24] Two studies were psychometric evaluations that evaluated survey instruments.[43,45] One study used mixed methodology including qualitative content analysis of interviews, observations, and chart reviews.[51] Three studies utilized a qualitative method to analyze interviews and open-ended questions.[19,50,59] Specific results are detailed below and are organized by study design.

Nurse Attitudes Assessed with Surveys and/or Psychometric Testing

Moore and Price (2004)[48] surveyed 121 acute care nurses from six teaching hospitals in Ireland to identify nurses' attitudes, behaviors, and perceived barriers towards PIP. A 3-part survey, based on a literature review, included questions on attitude, barriers, and demographics. Most nurses reported that RNs should concern themselves with PIP and that prevention was more important than treatment. One third admitted being less interested in PIP than in other aspects of care. Most nurses could not name the risk assessment tool they used and opined that their clinical judgment was better than the tools. All nurses who participated in prevention strategies admitted that they did not write prevention plans for all at-risk patients. They only sometimes or never updated plans while others admitted to writing prevention plans which they do not fulfill.

Källman and Suserud (2009)[46] surveyed 77 nurses and 77 nurse assistants in six hospitals and six clinics in Sweden exploring their attitudes, knowledge, barriers and facilitators, competence in PIP, and their performance of PIP. The units were not specified. The survey was based on instruments by Moore and Price (2004)[48] and Lewin and colleagues (2003)[60] which were translated to Swedish. Findings on attitudes were combined for RNs and NAs because no significant differences were identified between the groups. Most nurses agreed that they needed to be concerned with PIs, that most injuries could be avoided, that prevention was more important than treatment, and that risk assessment should be regularly performed on all patients.

Kalisch, Landstrom, and Williams (2009)[54] administered an instrument to measure missed nursing care (MISSCARE). The instrument was administered to 459 RNs across all units, including the ICU, at three Michigan hospitals to learn what nursing care was missed routinely and why. RNs reported to routinely miss PIP applicable care in the following areas: completing documentation of necessary data, monitoring intake/output, taking vital signs, assessing patients each shift, assisting with toileting needs within five minutes of request, ambulating patients three times a shift or as ordered, turning patients every two hours, bathing and skin care, engaging in patient teaching, and attending interdisciplinary care conferences whenever held. Reasons were cited as staff and supplies shortage.

In a follow-up study, Kalisch and colleagues (2011)[55] administered the MISSCARE survey to 3143 nurses and 943 nursing assistants across ten Midwest hospitals. Results indicated similar findings with the following top five missed care elements: ambulation, mouth care, care conference participation, timely medication administration, and patient turning.

Strand and Lindgren (2010)[34] surveyed 76 CCRNs and 70 licensed vocational nurses (LVNs) in four ICUs in a Swedish academic hospital to learn about attitudes toward PIP. Results

were combined for both groups, as no statistically significant differences were identified. The majority agreed that all patients were at risk for developing PIs. About 18% of nurses were neutral to the statement that treatment is a greater priority than prevention. Most agreed that frequent nursing assessments give an accurate account of PI risk and that most PIs could be avoided.

Beeckman et al. (2010)[43] surveyed 258 nurses and 291 nursing students at two acute care hospitals and one psychiatric hospital in Belgium and the Netherlands to develop and evaluate the Attitude toward Pressure ulcer Prevention Instrument (APuP). The units were not specified. The results of the psychometric evaluation indicated that the instrument and subscales were reliable. Other findings indicated that PI nurses had a significantly more positive attitude towards PIP than bedside nurses. General nurses had a more positive attitude than mental health RNs. Bachelor level RNs scored significantly higher than college level RNs.

Beeckman and colleagues (2011)[24] surveyed and observed 94 units at 14 Belgian hospitals to examine the relationships between nurses' knowledge of PIP, attitudes toward PIP, and performance of PIP. Units included medical, surgical, geriatric, ICU, and others that were not specified. The Pressure Ulcer Knowledge Assessment Tool (PUKT) [61] and the APuP [43] were administered to 553 nurses. Mean knowledge score was 49.7% and mean attitude score was 71.3%. Although 30% of patients were at risk only 13.9% received adequate prevention. Attitudes toward PIP and performing adequate PIP were significantly correlated. Knowledge and prevention were not correlated. Attitudes of staff nurses were significantly lower than wound care nurses. Bedside nurses with additional training in PIP did not exhibit significantly higher attitudes than those without additional training.

Florin and colleagues (2016)[45] surveyed a total of 196 RNs, 97 NAs, and 122 nursing students from surgical, orthopedic, medical, and palliative care units at three Swedish acute care hospitals. They aimed to learn attitudes toward PIP and to conduct a psychometric evaluation of the 13-item APuP [43] instrument translated into Swedish and in a Swedish context. All groups scored highly and similarly with a mean of 89%. This finding exceeded previously reported positive attitudes using the same tool.[24,46,48,34]

Tallier and colleagues (2017)[58] surveyed 62 perioperative nurses at ten acute care hospitals in the US to learn about their knowledge, perceived barriers, and attitudes toward PIP. The investigators used a modified PUKT knowledge survey [61] and the Moore and Price (2004)[48] attitude survey. The results included a mean knowledge score of 72%, low participation in continuing education, and positive attitudes towards PIP. Details of the attitude results were not provided.

Barakat and colleagues (2018)[42] conducted a cross-sectional survey study of 749 RNs and LVNs to examine knowledge and attitudes toward PIP and to explore the relationship between knowledge, attitude, and years of experience. The sample was recruited from acute, medical, and rehabilitation units at four acute care hospitals and five community health centers in Australia. Investigators used the PUKT knowledge survey [61] and the Moore and Price (2004) [48] survey. The combined results indicated high PIP knowledge and positive attitudes. Positive correlations were found between years of experience and attitudes and knowledge and attitudes. There was no correlation between years of experience and knowledge.

In summary, investigators in the above studies used modified attitude scales developed by Lewin et al. (2003)[60], Moore and Price (2004)[48], and Beeckman et al. (2010)[43] when a scale was used.[34,42,46,48] Responses to individual items were not always reported making direct

comparison across studies difficult. Instead, aggregate scores or the phrase positive attitudes toward PIP was used to describe scores above 70%. The majority of nurses in these studies scored highly on attitudes. Examples of items with high agreement were: Nearly all patients are at risk for developing PIs, most PIs could be avoided, and PIP is more important than treatment. Most opined that PIs do not happen as often anymore as they used to. Strand and Lindgren (2010)[34] conducted the only study limited to CCRNs. They reported similar findings.

Studies where RNs and NAs or LVNs were compared did not report significant differences in attitudes.[34,42,45,46] When wound care RNs were compared to bedside RNs, the specialized RNs scored significantly higher in attitude. Bachelor's degree RNs scored higher than college degree RNs.[24,43] Two studies explored additional questions beyond the above referenced items elucidating attitudes towards PIP: although RNs reported to perform all necessary functions for PIP, some admitted they did not write PIP plans, only updated them when remembering, or never wrote plans. If they did perform all tasks, RNs attributed it to wanting to fulfill essential nursing functions, or because others expected it, or because it was policy.[48] Kalisch, Landstrom, & Williams (2009)[54] reported similar findings in that RNs reported missing essential nursing functions routinely, which included tasks related to PIP, such as turning, ambulating, hygiene, and teaching.

Nurse Attitudes Assessed with Mixed Methods

Sving and colleagues (2012)[51] conducted a mixed methods study at three Swedish hospitals' geriatric, orthopedic, and medical units with nine RNs. The aim was to describe RNs' performance, documentation, and reflection on PIP by observation, chart review, and semi-structured interviews. Interview questions were based on the European Pressure Ulcer Advisory Panel's Quick Reference Guide and the researcher's nursing experience and were analyzed with

content analysis. Results varied across hospitals and included nurses not using risk assessment tools, viewing PIP tasks as a nursing assistant responsibility, performing care planning without assessing patients, and not needing risk assessment tools to detect at-risk patients. Some nurses reported that following guidelines was important while others thought as professionals they knew what to do. They also discussed the importance of multi-disciplinary teams and that bedside turning schedules only made families anxious if turning was not done per schedule.

Nurse Attitudes Explored with Qualitative Methods

Kalisch (2006)[59] used semi-structured interview guides to conduct 25 focus groups with acute care nurses, LVNs, and NAs from two hospitals' medical/surgical units in the US to learn about routinely missed care. Results showed that salient elements of nursing care were routinely missed and included RNs often delegating ambulation to assistants who reported to rarely comply. Nurses admitted that if they ambulated patients, it was motivated by physician pressure and that recommended two-hour turning intervals often were extended to 4, 6, 8 hours, or longer time spans. Feedings, patient hygiene, and educating were delayed or missed.

Reasons for missed care were: staff shortage and inexperience, competing priorities, tasks being time consuming, lacking supplies, viewing tasks as someone else's responsibility, delegating without following up, and forming habits of missing care because there were no consequences.[59] The missed care elements tend to be in areas where the negative impact is not immediately apparent and accountability was diffuse.

Athlin and colleagues (2009)[19] interviewed 15 community care and 15 acute care nurses from medical/surgical units and one ICU in Sweden. Questions addressed the discharge process, progress and regress of PIP, and barriers in PI care. Findings included acute care nurses viewing skin-related tasks as low status and therefore to be delegated. Nevertheless, RNs believed

themselves to be responsible for the supervision of PIP activities given their education but that physicians had the ultimate responsibility despite their knowledge deficit in the area. Nurses admitted neglecting PIs because they felt shame and guilt when they happened. Nurse support for LVNs was reported as delayed until PIs had occurred. Nurses needed to feel very motivated to remain focused on PIs.

Samuriwo's (2010)[50] conducted a qualitative study and interviewed 16 nurses and nursing students to learn the values they placed on PIP. Participants were recruited in Wales from three different units of a general hospital, one unit from a large urban hospital, and three different student cohorts. The method for question development was not outlined. All participants reported to value PIP highly but felt hindered by time constraints and by their colleagues not valuing PIP as highly. Prevention was oftentimes delegated. Nurses reported that wound specialist (WOCN) consultations were often delayed by a week and that WOCNs were used for treatment rather than for prevention. Finally, all nurses agreed that physicians were not interested in PIP, were only involved in treatment, and that they only engaged if a PI led to litigation.

In summary, all three reviewed qualitative studies developed questions based on experience or literature review. A common main theme across studies was nurses delegating important PIP tasks. Physicians were addressed in different contexts: nurses prioritized tasks that were prioritized by physicians.[50,59] Although nurses reported that physicians did not have the necessary knowledge, they had the ultimate responsibility for PIP.[19] While nurses in two studies expressed valuing attending to patients' needs and feeling regretful when not possible [50,59], other nurses viewed tasks related to PIP to be of low status and priority.[19]

A summary of the above 14 studies on nursing attitudes toward PIP is challenging as no two studies employed the same method. Even when surveys were used, three different sources and multiple modifications and sometimes translations were applied. Sometimes a single aggregate score was reported and interpreted as having a positive attitude toward PIP instead of providing a breakdown of item responses. A breakdown would have aided in understanding the phenomenon better but also would have assisted with comparing studies. When multiple hospital unit types and hence nursing specialties were included, results were not stratified. What can be concluded from the available data is that most nurses tend to have a positive reported attitude toward PIP. Curiously, there were multiple examples of nurses who admitted to holding beliefs and engaging in behaviors that are clearly detrimental to skin health, such as thinking of PIP as a low status task, turning patients at much greater intervals than evidence suggests, and thinking that all PIP responsibilities belong to assistants.

Providers' Attitudes Toward Pressure Injury Prevention

PIs first came to the attention of physicians, who started studying their etiology, physiology, and effects, in the 19th century.[62] Over time, the responsibility of PIP anecdotally and literally became a nursing issue. To what extent this change has been ingrained in health care is reflected in the plethora of studies conducted by nursing professionals on the prevention and treatment of PIs.[63-65] Given the move toward a more comprehensive model of care and interprofessional team work, the role of providers other than nurses has gained traction. Therefore, literature on providers' attitudes toward PIs in ICUs is relatively recent.

Of the four articles included in the review discussing elements that relate to provider attitudes around PIs, three were conducted in the US and one was a systematic review without restrictions on country. Only two aimed to explore attitudes directly.[44,57] A single study was

conducted with ICU providers and none included providers other than medical doctors (MDs).[44] Four studies utilized surveys.[44,56,57] One study, the systematic review [52], was included in the review, because it provides historical data on attitudes. The literature included in the review ranged from 1966 to 1998. Of the 76 articles included in this systematic review, 120 studies used survey instruments.[52]

Understanding barriers to guideline adherence is a first step to learning physician attitudes toward PIP. Cabana and colleagues (1999)[52] conducted a systematic review to learn about barriers to physician adherence to clinical practice guidelines to inform the process of changing physician behavior. Pertinent findings included physicians' lack of awareness of and disagreement with guidelines, a lack of self-efficacy, outcome expectancy, and motivation to change behavior. They also interpreted evidence differently, experienced inertia of previous practice, time, staff and equipment constraints, and the inability to reconcile patient and family desires with guideline recommendations.[52]

Odierna and Zeleznik (2003)[56] surveyed 42 geriatric fellows from ten fellowship programs in New York. They aimed to assess educational experiences regarding PIP and to validate a knowledge survey of physicians-in-training. Findings were as follows: physicians reported viewing themselves as adequately prepared to lead and teach teams about PIs. They held teaching positions and taught medical students, residents, nurses, and physician assistants. The mean knowledge score for this sample was 58%.

Suen and colleagues (2012)[57] used Moore's and Price's (2004)[48] attitude survey and a wound knowledge test with 19 internal medicine interns and 20 residents at a Massachusetts hospital. Both groups demonstrated positive attitudes toward PIP. More interns opined that prevention was time consuming, less of a concern in practice, and a lower priority than other care

areas. Both groups agreed that prevention was a greater priority than treatment and that using risk assessment tools was better than relying on clinical judgment. Correct wound identification and staging varied widely.

Cox and colleagues (2013)[44] administered an online three-part survey to 56 ICU physicians at an academic, a community, a teaching, and a Veterans' Administration hospital in New Jersey. The survey aimed to determine ICU physicians' attitudes, beliefs, and knowledge toward PIP and treatment in ICU patients. The instrument was developed by the research team. The majority of physicians reported their medical education to be adequate to poor to prepare them for PIP. Less than half believed that their fellowship training prepared them adequately while others considered their role in prevention and treatment to be very important. ICU physicians believed that the role of bedside nurses was very important in prevention compared to advance practice nurses.

In summary, two studies surveyed physicians about the adequacy of their education and experiences in feeling prepared for PIP or to teach others. Although only less than half the physicians identified the most widely used risk assessment tool and 52 to 67% identified stages correctly immediately after an educational intervention, physicians deemed their education and preparation adequate to teach others about PIP. Other physicians reported their education prepared them poorly to adequately educate on PIP.[44,56] Physicians reported that they and bedside nurses both have an important role in PIP. It is unclear how they defined having an important role. Sue and colleagues (2012)[57] used the Moore and Price (2004)[48] attitude scale and had similar findings compared to the reviewed nursing studies that used this scale. A notable difference between physicians and nurses was that physicians did not agree that their clinical

judgment was better than any risk assessment tool.[48,51] Only Cox and colleagues (2013)[44] explored the attitudes of ICU physicians toward PIP.

The systematic review, which predates these studies, alludes to some of the above findings as well. Cabana and colleagues (1999)[52] learned that physicians had a lack of awareness of guidelines for various reasons. In a related finding, Odierna and Zeleznik (2003)[56] learned that less than half of physicians were able to identify the most commonly used risk assessment tool. Cabana and colleagues (1999)[52] also found physicians reported a lack of self-efficacy especially regarding preventive health education. Cox et al (2013)[44] and Odierna and Zeleznik (2003)[56] learned that physicians judged their education to be poor or adequate which could lead to lack of self-efficacy regarding PIP.

Patients' and Families'/Caregivers' Attitudes Regarding Pressure Injury Prevention

Four studies explored the patient's perspective on PIs. No studies were found that explored ICU patients' perspectives. This population is unique given its high acuity, vulnerability, and dependence on the ICU staff and their family caregivers. Of the four reviewed studies, two were conducted in Australia, one in the UK and Belgium, while the systematic review included studies from across Europe, the US, Asia, and Australia.

Two studies used a qualitative design with semi-structured interviews [47,49] while one used an unstructured interview guide.[66] The fourth study is a systematic review of primary research related to Health-Related Quality of Life measures (HRQL). No studies were identified that involved the caregivers of patients with or without PIs in any setting.

Hopkins and colleagues (2006)[66] interviewed eight participants in the UK and in Belgium in the community setting to learn about individuals' experiences living with stage 3 or 4 PIs. Unstructured interviews were conducted and analyzed following the phenomenological

approach. Participants described the very occurrence of a PI as shocking in itself implying they were not aware that these injuries could befall them. Participants also reported endless pain caused by various aspects of the injuries and a restricted life style. Coping occurred by comparing themselves to others in better or worse conditions and eventually by acceptance. Providers were described negatively, because they did not recognize the severity of participants' pain and suffering and because they did not control their pain effectively.

Latimer and colleagues (2014)[47] interviewed 20 patients with and without PIs on four medical units in two Australian hospitals to learn about their perceptions of patients' current and future role in PIP. Semi-structured interviews were conducted at the bedside. Patients reported to disengage from nurses and to become passive care recipients because they felt frustrated, angry, and forgotten. Knowing that PIP could provide pain relief increased patients' engagement. When staff and family encouraged patients and physically helped them, it increased their engagement.

Roberts and colleagues (2017)[49] interviewed 19 medical and surgical patients across four acute care hospitals in Australia after the implementation of a PIP bundle to learn their perceptions of what helped them stay engaged with PIP. Patients reported valuing human interaction with staff highly and thought it to be even more useful than the intervention itself. The human interaction that made them feel important and valued included skin checks, assistance, encouragement, and advice. Some patients noted that although necessary, they found written material burdensome. They valued that the intervention reinforced their previous knowledge and they liked how the new knowledge empowered them to act. Patients also appreciated that the intervention increased or formed their awareness that they were actually at risk of developing PIs. Negative or neutral attitudes were reported by some post-surgery or by those affected by medications leaving them tired or unable to concentrate. Some found the

engagement message difficult to connect with, because they felt they were too old to engage actively.

Gorecki and colleagues (2009)[53] conducted a systematic review on primary research reporting the impact of PI and PIP on health-related quality of life (HRQL) as reported by patients. Studies conducted across Europe, US, Asia, and Australia were reviewed. Final sample included 10 qualitative and 21 quantitative studies with a total of 2,463 adults ages 17 to 96 who suffered from PIs. HRQL themes that emerged included physical impact, social impact, psychological effect, PI symptoms, general health, and other impacts of PIs, healthcare professional–client relationships, need for versus effect of interventions, impact on others, financial impact, perceived etiology, and need for knowledge. Investigators did not identify any studies conducted with ICU patients.

Although none of the studies exploring patients' PIP attitudes were conducted with ICU patients, the data indicate that most individuals value PIP and value being engaged in prevention.[47,49] They reported feeling like active participants rather than passive recipients of care. However, patient disengagement and frustration with the health care team were apparent in these studies. This disengagement could develop quickly and affect patients physically and psychologically. Examples of these are when nurses did not respond to patient concerns and requests without providing an explanation and when physicians did not manage patients' pain adequately.[47,53] It is apparent that patient-provider relationships and human interaction, whether in the form of advocacy by family or staff and encouragement or the lack of these, impact how patients see PIP and its value.

Discussion

The aim of this literature review was to synthesize the state of science on attitudes of major stakeholders regarding PIP in ICUs. Only twenty-two studies were found that discussed the attitudes of nurses, patients, and physicians regarding PIP in some manner. While studies conducted with ICU stakeholders only are scarce, there are none exploring families', caregivers', and leaders' attitudes toward PIP. Although nurse practitioners and physician assistants are recognized and valuable staff members among ICU providers, none of the four provider studies reviewed included these.

Findings confirm that research exploring stakeholder attitudes toward PIP are still few. The priority given to understanding this phenomenon is higher outside the US, as most studies were conducted in Europe and Australia. The review of the studies examining nursing attitudes showed that although many value PIP, they also hold beliefs and report conduct that is detrimental to maintaining skin health. Examples included missing crucial nursing care, such as turning patients, attending to their hygiene, and taking responsibility for PIP. Although studies where nurses reported to delegate PIP almost in its entirety did not take place in ICUs, the findings are concerning. Many nurses do not start out in the ICU but transfer from other units bringing with them ingrained routines and practices. If delegating certain responsibilities is an ingrained habit, prioritizing those activities in a new setting may be challenging. It may also be argued that ICUs do not have the luxury of nursing assistants and LVNs, which is true in most facilities. However, ICUs often have similar resources, such as the Lift Team which rounds on all patients needing assistance turning on a two-hour basis. Other resources are restorative health technicians who help transfer, reposition, and ambulate, as well as PTs and OTs, which were referenced by Sving and colleagues (2012).[51] Previous research findings into nurses' pressure-injury-related attitudes and behaviors have been contradictory suggesting that they place both

high and low value on PIP.[19,24,34,42-59] Other studies have suggested that nurses place a high value on prevention, but do not deliver the appropriate standard of care for a range of practical reasons.[19,50,51,54,55,59] Since differing viewpoints about the value nurses place on PIP currently exist, further research on nurses' PIP attitudes is needed.

There appears to be confusion regarding the physicians' role in PIP. Patients and nurses discuss physicians' roles peripherally and not as an active or positive part of the PIP process. One example was patients' perceptions that physicians did not adequately control their PI-related pain. Other examples were nurses believing that physicians had the ultimate responsibility for PIP despite a knowledge deficit or that physicians only showed interest if PIs led to litigation. Physicians, in spite of their limited preparation, saw themselves as having an important role in PIP. They admitted to not be adequately prepared to engage in effective PIP, but still felt they were justified and capable of holding PIP teaching positions. The lack of experience and self-efficacy in this area, may contribute to physicians opining that risk assessment tools were better than relying on clinical judgment.

The scarcity of research conducted in this area may indicate the low priority that providers place on prevention and whether they see it as a joint responsibility or as that of the nursing service alone. The findings indicate that the health care system is not approximating the widely emphasized interprofessional approach to care relating to PIP.

Leaders' Attitudes around Pressure Injury Prevention

No studies investigating the PIP attitudes of leaders or administrators in the Intensive Care Unit or otherwise were identified.

Conclusion

The health care field is recognizing PI as events that can be avoided in most instances and as such most are viewed as medical errors.[7] While other hospital acquired conditions have seen a decrease in recent years, hospital acquired pressure injuries have actually increased.[(3)] This is an especially challenging issue when it comes to the most vulnerable hospital populations, the intensive care patients. While care providers, administrators, patients and families are fighting to help the patient recover from critical conditions, clinicians have the additional responsibility to prevent further harm befalling patients. Approaches thus far have emphasized physiological risk factors, the development of evidence based clinical guidelines, knowledge assessments, and intervention studies with limited success.

Ensuring patient safety requires more than the implementation of clinical guidelines. An extensive and iterative search of literature makes evident a glaring gap in our comprehension of the human factor around the phenomenon of pressure injuries indicating a dire need for targeted and generative/qualitative research. Human factors, such as attitudes, impact clinical decision making which can lead to medical errors. Yet, attitudes towards the costliest medical error, pressure injuries, remain largely unexplored worldwide but especially so in the US. Studies exploring four major stakeholder attitudes are even scarcer. Finally, studies that give a voice to ICU patients and their families do not exist. The immense human and financial cost that these injuries inflict place a demand on health care organizations and researchers alike to investigate novel approaches to understanding this phenomenon.

TABLE 1

Characteristics of Studies Included in the Review

Study/Focus	Location	Design	Setting	Methods	Findings
Registered Nurses					
Kalisch (2006); learn about missed care and reasons for missed care	United States	Qualitative content analysis; grounded theory	medical/surgical unit, 2 hospitals	Sample: 107 RN, 15 LVN, 51 NA Instrument: total of 25 focus groups; 90 to 120 minutes long with semi-structured interview guides	-receiving no consequences for missing care makes it a habit -denial that care may be missed -staff/supply shortage, work priorities -PIP time consuming→longer tasks less likely to be completed -time constraints prevent ambulating patients→delegate to NA -PIP tasks mostly delegated to NAs -NAs deny ambulating often -MD pressure/follow-up impetus for doing PIP -Turning at longer intervals than guidelines -Delayed/missed feedings

					-Patient harm due to missed patient education -Hygiene (bath, sheets) often missed
Athlin, Idvall, Jemfält, and Johansson (2009); To identify contributing factors to progress or regress of PIs in care trajectory	Sweden	Qualitative content analysis	4 medical, 11 surgical, 1 ICU 2 hospitals and community care	Sample: 30 RNs (15 acute care and 15 community care); participants selected by head nurses based on criteria supplied by researchers Individual interviews; Voice of both groups (acute and community) were reported combined saying they were mostly the same. Instrument: interview guide developed based on literature review and investigators' own experiences as nurses. Questions around discharge process,	-limitation/possible bias because access to RNs by head nurse selection. -main focus on disease and treatment that can lead to PIs -prevention and intervention low priority, low status, -responsibility of LVNs but ultimate responsibility with RN -admitted RNs often not interested; therefore LVNs feel unsupported leading to PIs -see MDs with having ultimate responsibility without having PIP knowledge -erythema not regarded as PIs, therefore unreported and untreated

				progress/regress of PI and barriers in PI care. 1 hour long.	-associate PIs with shame and guilt; therefore neglect them -believe PIs uncommon now
Samuriwo (2010). Value nurses and nursing students place on PU prevention.	Wales	Qualitative, grounded theory	3 different units of a general hospital, 1 unit from large urban hospital, units not specified; and students from 3 cohorts from one university	Sample: n=16: 6 clinical RN, 3 student nurses, 6 nurse managers, and 1 nurse lecturer; participants were all volunteers. Although nurse managers are included here, their reports are not stratified neither synthesized or even plentiful Instrument: Semi-structured interviews; provides stem questions	-Possible bias with self-selection -Professional school deficiencies pondered as reason for not prioritizing PIP -High value of PIP -Environmental factors and lack of time hinder PIP. -Prevention delegated to students and NAs who feel unsupported. -Values influence PIP performance -Relied on other disciplines: heavily physical therapy to do most/all of repositioning; dietary; wound team too busy for some while good resource for others

					-RNs report physicians only interested if PI leads to an investigation
Sving et al. (2012). To describe how RNs perform, document, and reflect on PIP	Sweden	Qualitative content analysis/Quantitative: Mixed Methods: observation, interview, chart review	3 units: geriatric, orthopedic, medical, 3 hospitals	Sample: 9 RNs (3 RNs/unit) Observations of RNs with at-risk patient (as determined by researcher with modified Norton scale) for entire shift. Then followed by semi-structured interviews within 4 to 18 days post observation with that RN about encounter followed by chart review. 32 patient chart reviews nursing documentation relating to risk assessments, skin assessment, care plans; 37-70min(guide based on EPUAP Quick Reference Guide and researcher's nursing experience)	Overarching theme: PIP in daily practice depended on the caring culture of the ward. <u>Observations (74 hours):</u> -Very few PIP activities by RNs. Explained saying: delegated to NAs; they were trusted. -missed care: Minimal communication with NAs though PIP delegated to them. -Repositioning done for reasons other than PIP -missed care: risk assessment tools were not used -RNs discussed PI staging without doing skin assessments

					-missed care: no PIP education observed -Wards differed in degree of structured PIP strategy from structured to unplanned/no structure <u>Interviews</u>: -Reported high priority for PIP; should be performed -Only identified 1/3 of at-risk patients under their care as at-risk -PIP deemed NA task. Delegated. -workload led to deprioritizing PIP -no PIP on uncooperative patients -1 hospital's nurses thought following guidelines important in early detection. Another hospital's nurses did not agree stating that professionals knew what to do

					-some nurses thought turning schedules were unnecessary as relatives became anxious about them -although PIP important, delegated to assistants who are trusted even if they did not document -recognized importance of multidisciplinary team with PT/OT -some thought routines important while others did not <u>Chart Review:</u> -RNs documented tasks not performed. E.g.: 32% risk assessments documented that were not performed.
Moore and Price (2004); To identify nurses' attitudes, behaviors, and	Ireland	Cross-sectional survey	"Wide range of clinical areas"; unclear what units 6 teaching hospitals	Sample: 121 RNs Instrument: survey created by authors and piloted with 20 RNs with 28 questions under 3	- The staff nurses had positive attitude towards prevention (median 1⁄4 40, range 28–50). -majority agree all patients at risk

perceived barriers towards PIP				sections: attitude, barriers, demographics, attitude section with 5 point Likert scale; The lowest possible score (negative attitude) in the attitude section was 11 with a highest possible score of 55. Barriers solicited with open-ended questions.	-prevention more important than treatment -51% PIP low priority -28% less interested in PIP -do perform essential nursing duties -11-19% do tasks because prescribed or others expected them to -~50% PIP time consuming -~33% clinical judgment better than tool; most couldn't name tool -some updated plans when remembered -did not write PIP plan for all -4% never updated PIP plans and some wrote plans that they did not perform
Kalisch, Landstrom, and Williams (2009); To identify routine missed	Michigan	Cross-sectional survey	3 hospitals, all units including ICU (total 28 units)	Sample: 459 RNs	Missed Care: -missed doing complete documentation of necessary data

nursing care and why and for psychometric testing of MISSCARE survey				Instrument: Missed Nursing Care Survey (MISSCARE; Kalisch & Williams, 2009); no open-ended questions; choices on survey for missed care: "rarely," "occasionally," "frequently," "al- ways" or "non applicable." Choices for reasons: "significant factor," "moderate factor," "minor factor," or "not a reason for unmet nursing care."	-only 57% monitor intake/output; 40% take vital signs per order; 17% assess patients each shift; 66% assist with toileting needs within 5 minutes, 84% ambulate patients per order; 82% turn patients every 2 hours; 63% hygiene; 80% patient teaching, 73% attend rounds Reasons: -staff/supplies shortage -communication breakdown with medical staff, assistants not reporting care was missed, tension with coworker
Källman and Suserud (2009); Identify RNs' and NAs' attitudes, knowledge, performance of	Sweden	Cross-sectional survey	6 hospitals (units not specified) and 6 clinics	Sample: 77 RNs; 77 NAs Instrument: Final survey with total of 47 items based on 2 instruments by Moore and Price (2004) and Lewin et al (2003).	-overall, both RNs and NAs demonstrated positive attitude toward PIP. No significant differences between NAs and RNs (p=0.078) -all patients at risk for PIs

prevention, perceived barriers/facilitators, competence in PIP				Attitude measured with 11 items with Likert scale from Moore & Price, 2004; no open-ended questions; translated into Swedish by author; then supplemented with additional questions while others deleted. Pilot tested on 4 RN and 4 NA	-63% believed PIs not as common anymore -most PIs preventable. 20.7% disagreed -need to concern themselves with PIP -15% neutral on whether prevention more important than treatment -68% disagreed that they were less interested in PIP than other areas but 20% were neutral -disagree that PIP low priority compared to other care -equal numbers agree/disagree that PIP is time consuming -risk assessment should be performed regularly
Strand & Lindgren (2010). ICU RNs' and LVNs' attitudes, knowledge, and	Sweden	Cross-sectional survey	4 ICUs (thoracic, burn, neurosurgical, and general ICU) from 1 hospital	Sample: 76 RNs, 70 LVNs Instruments Källman and Suserud's (2009) 47 item survey	-PIP is viewed as important part of daily care. -all patients at risk and most can be avoided

perceived barriers and opportunities towards PIP				which was based on Moore and Price (2004) and Lewin et al. (2003). Some wording changed to fit ICU population. Piloted on 4 RN and 4 LVN in different hospital. Attitude measured with Likert scale; knowledge by multiple choice and open-ended questions, opportunities and barriers by open-ended questions	-about half believed PIs not as frequent anymore -LVNs scored significantly lower than RNs in identifying risk factors and preventive measures. -18% neutral on treatment greater priority than prevention -continuous assessment gives accurate risk -Nurses with education in critical care or anesthesia had more positive attitudes than other nurses. -Knowledge was adequate. -No routines for risk assessment reported by 67.8% + 22.6% not sure -Most frequent barriers: Shortage in 1. Time (57.8%) 2, competing priorities like patient acuity, 3. Short staffed 4. Knowledge/supply shortage

					Most frequent facilitators: 1. Knowledge (38%) 2. Supplies 3 .time 4.Adequate staffing,
Kalisch, Tschannen, Lee, and Friese (2011); To identify extent and type of missed care	Midwest, US	Cross-sectional survey	medical/surgical, rehab, ICU; 10 hospitals	Sample: 3143 RNs, 943 NAs Instrument: Missed Nursing Care Survey (MISSCARE; Kalisch & Williams, 2009)	Missed Care: -ambulation, oral hygiene, rounds, timely medication administration, patient turning Reasons: -staff/material shortage -communication breakdown
Beeckman et al. (2011). Relationships between nurses' knowledge of, attitudes toward, and performance of PIP.	Belgium	Cross-Sectional survey and observation to determine prevalence and adequacy of PIP	94 units (medical, surgical, geriatric, ICU, other) at 14 hospitals	Sample: 553 nurses, 2,105 patients (of which 625 were at risk for PUs=30%) Instrument: Pressure Ulcer Knowledge Assessment Tool (PUKT) (Beeckman et al, 2010) with 26-item multiple choice, attitude by 13-item APuP (Beeckman et al., 2010), and	-30% of patients at-risk (Braden<17) but only 13.9% received adequate PIP. -high attitude scores (71%) -staff nurse attitudes significantly lower than wound care nurses -but, additional training did not significantly increase attitudes -adequate PIP significantly correlated with attitude (units where more than

				performance by observation by 2 nurses	30% of at-risk patients received adequate PIP, had nurses with significantly higher attitudes) -Mean knowledge 49.7% -Attitude had positive correlation with knowledge and performance. -Knowledge was insufficient (knowledge and prevention not correlated) -Education increased knowledge.
Tallier et al (2017); to learn perioperative nurses' knowledge, barriers, and attitudes around PIP.	United States	Cross-sectional survey	10 acute care hospitals, units not specified	Sample: 62 perioperative RNs Instrument: Knowledge survey based on original 47-item Pressure Ulcer Knowledge Test (PUKT; Pieper & Mott, 1995); PUKT was modified adding 3 items to address DTI; Demographic survey measured nurses' participation in continuing education; Attitudes,	-total knowledge score of 72%, -low participation in continuing education -positive attitudes towards PIP 72% (individual items not provided)

				behaviors, perceived barriers via modified Pressure Ulcer Questionnaire (Moore & Price, 2004)	
Barakat et al (2018); to examine the knowledge and attitudes of nurses on PIP and to explore relationship between knowledge, attitude, years experience	Australia	Cross-sectional survey	Acute, medical, rehabilitation units; 4 hospitals and 5 community health centers	Sample: 749 RNs and LVNs (combined number provided; n for each is unclear) Instrument: Pressure Ulcer Knowledge Test (PUKT) 47 items (Pieper & Mott, 1995) & Staff Attitude Scale (Moore and Price, 2004) 11 item Likert	About 60% scored highly at 78.7% on knowledge. The mean attitude score was positive at 80.7%. There was a significant positive correlation between nurses' years of experience and attitudes, but there was no correlation between years of experience and knowledge. Knowledge and attitudes were also significantly positively correlated.
Beeckman, Defloor et al. (2010). Development and evaluation of the Attitude toward Pressure Ulcer	Belgium and Netherlands	Psychometric evaluation	2 general hospitals and 1 psychiatric hospital (acute care units not specific)	Sample: 258 nurses, 291 nursing students Instrument: 13-item, 4-point Likert (APuP) based on literature review	-Wound care nurses, have a more positive attitude toward PIP than bedside RNs -General RNs more positive attitude than mental health RNs

Prevention Instrument (APuP).					-RNs more positive attitude than students -Bachelor degree more positive than AA -Support for the reliability and validity of a new instrument to assess nurses' attitudes toward PU prevention.
Florin et al (2016); to learn attitudes around PIP and conduct psychometric evaluation of APuP survey in Swedish context	Sweden	Cross-sectional survey, psychometric evaluation	Surgical, orthopedic, medical, palliative units; 3 hospitals	Sample: 415 (196 RNs, 97 NAs, 122 students) Instrument: 13-item APuP (Beeckman et al., 2010a) translated to Swedish	All groups scored highly and similarly on attitude toward PIP with mean of 89%. -4 items showed significant difference between groups: Students lower confidence in ability to prevent PIs than NA/RN. Also rated training as less rigorous than NA/RN. Students found PIP too difficult compared to NA/RN. Finally, students scored importance of own role in PIP as more important

					compared to RNs. Findings indicated no support in Swedish sample for reported APuP 5 factor model.
Providers (MD, DO, PA, NP)					
Cabana et al, 1999; to identify barriers for physician adherence to clinical guidelines to inform understanding of physician knowledge, attitudes, and behaviors	English language literature; no restriction on country	Systematic review;	Specialty and setting for physicians unclear	**Sample:** 76 articles including 120 surveys **Instrument:** abstraction by 2 investigators	-barriers classified into themes: knowledge, attitudes, and behavior -attitudes: -lack of agreement with guidelines judging to be too restrictive or not agreeing with previous practice; interpreting results differently than authors -lack of self-efficacy due to low confidence in ability or lack of preparation; especially regarding preventive health education and counseling -lack of outcome expectancy believing recommendation won't lead to improved outcome

					-inertia of previous practice and lack of motivation to change
Odierna and Zeleznik (2003); To assess educational experiences of geriatric fellows on PIs and to validate survey to assess PI content knowledge of physicians in training	New York State, US	Cross-sectional study; survey	10 geriatric fellowship programs	**Sample:** 42 geriatric fellows in New York State **Instrument:** 5-item survey on feelings of preparation to manage PI patients and to teach other clinicians about PIs (5 point Likert scale). Educational experiences assessed with all-that-apply format. 11-item Content knowledge survey originally validated for RNs (Norvid, Ferrell, Josephson, 1996) updated based on Agency for Healthcare Research and Quality guidelines. Final survey had 11 items	-physicians judged selves as adequately prepared to lead and teach teams about PIs -69% taught medical students, residents, nurses, and physician assistants on PIs -only 48% able to identify Braden -52-67% identified PI stage descriptions correctly -mean content knowledge 58% with individual fellows ranging from 20% to 80%

Suen et al. (2012); to learn about attitudes and knowledge of interns and residents on PIP and assessment	Boston, MA, US	Cross-sectional survey	1 hospital; internal medicine	**Sample:** specialty: internal medicine: 19 interns and 20 residents completed survey while attending educational session on PIP and care by an MD and wound care RNs. 11-item attitude survey before class. 21-item wound identification/staging test post lecture **Instrument**: Moore & Price (2004) 11 item Likert attitude survey, wound test	-Interns more positive attitude (p=0.003) toward PIP than residents but both were positive -More interns thought PIP is time consuming, less concerning in practice, lower priority than other areas; more likely to agree that patients tend to not get as many PI nowadays -both agree that prevention more important than treatment -believed using risk assessment tools better than relying on clinical judgment -staging varied widely from 3-100%
Cox et al. (2013); to determine ICU physicians' attitudes, beliefs,	New Jersey, US	Cross-sectional survey;	3 = 1 academic, 1 community,	**Sample:** 56 ICU physicians **Instrument:** 3-part survey developed by research team (including an intensivist): 15	-Most (69.6%) physicians thought their education was poor to adequate to prepare them to adequately prevent PIs

knowledge toward PIP and treatment in ICU patients		Survey Monkey	1 Veterans Administration	demographic items, 14 five-point Likert on attitudes, 24 knowledge adapted from Pieper's and Mott's PUKT (1995)	-Less than half (46.4%) thought fellowship training prepared them adequately -Perceived overall knowledge of PIs very poor to adequate 67.9%. -Majority thought their role in prevention is important -85.7% considered role of bedside RN very important in PIP; 53.6% of advance practice nurse -Expressed importance of physicians to be engaged in prevention and treatment research
Patients & Families/Caregivers					
Hopkins et al. (2006); to learn about individuals' experiences in the community living	United Kingdom and Belgium	Qualitative, Heideggerian phenomenological approach	community	**Sample:** 8 participants with stage 3 or 4 PIs present for more than one month over age of 65	-reality of PIs happening to them was a shock -reported endless pain -restricted life -coping by comparing self to others

with stage 3 or 4 PIs				**Instrument:** Unstructured Interviews; interview done in Belgium translated to English	-felt providers did not recognize their pain and suffering and did not prescribe analgesia effectively
Gorecki et al. (2009) To identify the impact of PIs and PIP on health-related quality of life HRQL	Across Europe, US, Asia, Australia	Systematic review of primary research reporting the impact of PI and PIP on HRQL according to direct patient reports; Content analysis	acute, community, and long term care settings	Sample: 2,463 adults; 17 year old to 96 year old participants with PIs; 10 qualitative and 21 quantitative studies **Instrument**: abstraction following the Qualitative Assessment and Review Instrument (2005) for qualitative data. Quantitative data were extracted by identifying individual questionnaire items; and summarizing Participant characteristic, setting, geographical location, study design, HRQL assessment	31 studies found to report impact of PI and PIP on HRQL. 10 qualitative and 21 quantitative. 11 HRQL themes emerged: physical impact, social impact, psychological effect, PI symptoms, general health, and other impacts of PIs: healthcare professional–client relationships, need for versus effect of interventions, impact on others, financial impact, perceived etiology, and need for knowledge.

				methods, and results were summarized.	
Latimer et al (2014); to learn patients' perceptions of their current and future role in PIP	Australia	Qualitative content analysis	4 medical units at 2 hospitals	**Sample:** 20 adult patients with and without PIs **Instrument:** Semi-structured Interviews; 10 questions informed by literature review. 10-15 minutes long conducted at the bedside.	-3 categories emerged: experiencing PIs, participating in PIP, resourcing PIP and treatment -expressed frustration, anger, feeling forgotten -led patients to disengage from nurses -became passive recipients of PIP
Roberts et al (2017); to learn patients' perceptions of what helps to stay engaged with PIP	Australia	Qualitative	medical and surgical patients; 4 acute care hospitals	**Sample:** 19 patients; sub-set of patients in trial testing a PIP care bundle. **Instrument:** semi-structured Interviews	-valued human interaction of staff highly -human interaction more useful than information on PIP -human interaction made them feel important, valued. Included: skin checks, general assistance, encouragement, advice

					-motivator and reminder to stay engaged -some saw information on PIP interventions as burdensome -valued that PIP reinforced their previous knowledge -new PIP knowledge empowered them to act -valued that PIP information/intervention formed and increased their own awareness that PIs could happen to them -negative or neutral attitude regarding PIP when they felt they weren't in a state to receive it (surgery, medication, tired, etc) -some did not judge PIP doable given their frailty

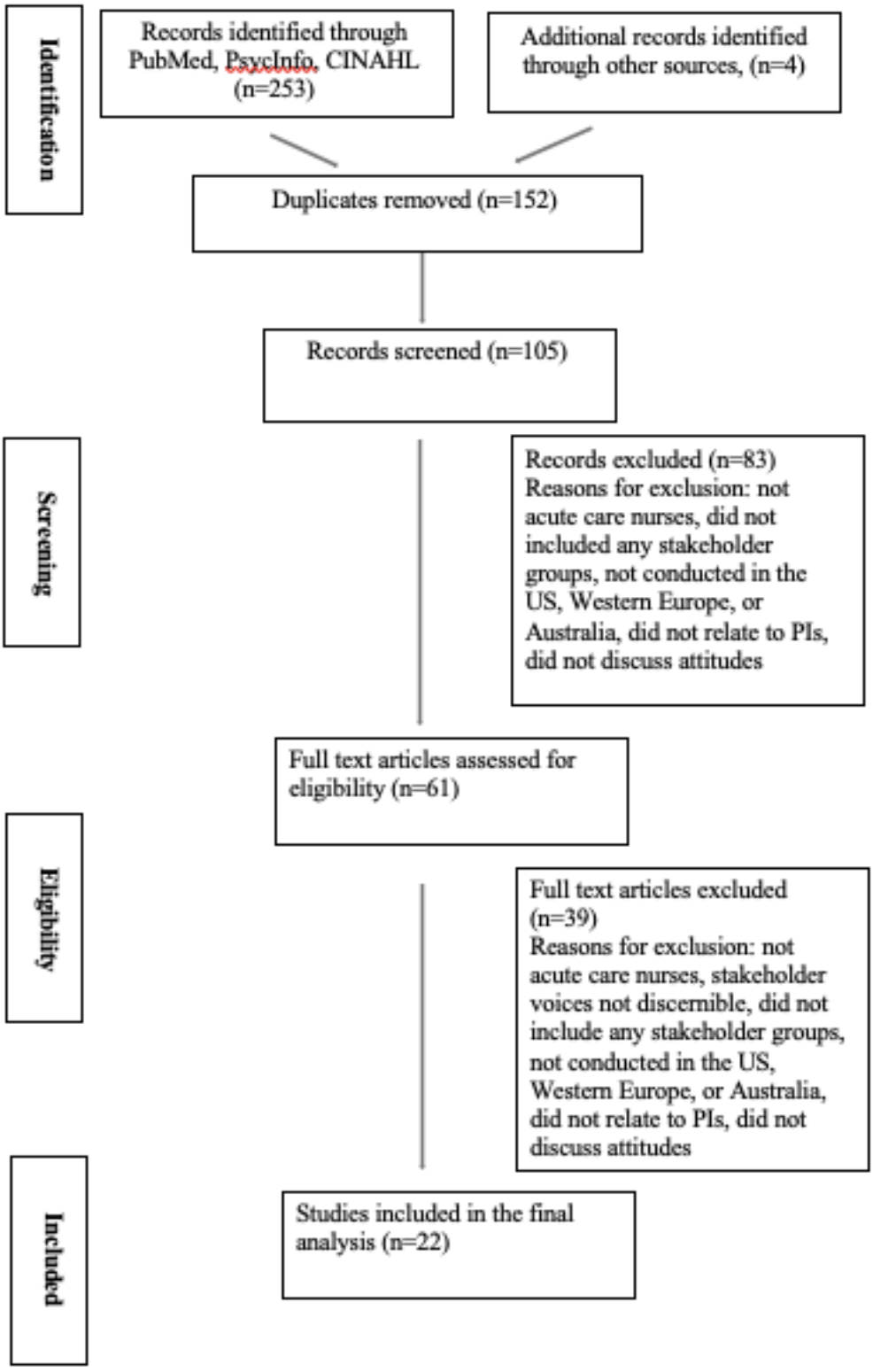

Figure 1
Prisma diagram showing review process

References

1. Centers for Medicare & Medicaid Services, Office of the Actuary, National Health Statistics Group; U.S. Department of Commerce, Bureau of Economic Analysis; and U.S. Bureau of the Census. (2018). National Health Expenditures; Aggregate and Per Capita Amounts, Annual Percent Change and Percent Distribution: Calendar Years 1960-2013. Retrieved from https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/NationalHealthExpendData/NationalHealthAccountsHistorical.html
2. Strategies for Preventing Pressure Ulcers, Joint Commission Perspectives on Patient Safety, Volume 8, Number 1, January 2008, pp.5-7(3). http://www.jcrinc.com/Pressure-Ulcers-stage-III-IV-decubitis-ulcers/.
3. AHRQ National Scorecard on Hospital-Acquired Conditions. Content last reviewed January 2019. Agency for Healthcare Research and Quality, Rockville, MD. http://www.ahrq.gov/professionals/quality-patient-safety/pfp/index.html
4. Squitieri, L., Waxman, D. A., Mangione, C. M., Saliba, D., Ko, C. Y., Needleman, J., & Ganz, D. A. (2018). Evaluation of the Present-on-Admission Indicator among Hospitalized Fee for-Service Medicare Patients with a Pressure Ulcer Diagnosis: Coding Patterns and Impact on Hospital-Acquired Pressure Ulcer Rates. *Health Services Research*, *53*, 2970-2987.
5. Teague L, Mahoney J, Goodman L, Paulden M, Poss J, Li J, et al. (2011). Early prevention of pressure ulcers among elderly patients admitted through emergency departments: a cost-effectiveness analysis. *Annals of Emergency Medicine.;* 58:468-78.

6. National Healthcare Quality and Disparities Report chartbook on patient safety. Rockville, MD: Agency for Healthcare Research and Quality; July 2017. AHRQ Pub. No. 17-0037-EF. bit.ly/2Iv75n1
7. Shreve, J., Van Den Bos, J., Gray, T., Halford, M., Rustagi, K., & Ziemkiewicz, E. (2010). The economic measurement of medical errors sponsored by society of actuaries' health section. Milliman Inc.
8. Anderson M,. Finch-Guthrie PL.., Kraft W., Reicks P., Skay C., Beal A.L. (2015). Universal pressure ulcer prevention bundle with WOC nurse support. *Journal of Wound Ostomy Continence Nursing* 42(3), 217–225
9. Benoit, Jr., R. A., & Watts, C. (2007). The effect of a pressure ulcer prevention program and the bowel management system in reducing pressure ulcer prevalence in an ICU setting. *Journal of Wound Ostomy & Continence Nursing*, 34(2), 163-175.
10. Brown DS, Donaldson N, Burnes Bolton L, Aydin CE (2010) Nursing-sensitive benchmarks for hospitals to gauge high-reliability performance. Journal of Healthcare Quality 32(6):9–17
11. Compton, F., Hoffmann, F., Hortig, T., Strauss, M., Frey, J., Zidek, W., & Schafer, J. H. (2008). Pressure ulcer predictors in ICU patients: nursing skin assessment versus objective parameters. *Journal of Wound Care,* 17(10).
12. VanGilder, M., Amlung, S., Harrison, P., & Meyer, S. (2009). Results of the 2008–2009 International Pressure Ulcer Prevalence™ Survey and a 3-year, acute care, unit-specific analysis. *Ostomy Wound Management, 55*, 39-45.
13. Lyder, CH, & Ayello, EA. Patient safety and quality: an evidence-based handbook for nurses. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); (2008).

Pressure ulcers: a patient safety issue. pp. 1–33. www.ahrq.gov/qual/nurseshdbk/docs/LyderC_PUPSI.pdf.

14. National Pressure Ulcer Advisory Panel, European Pressure Ulcer Advisory Panel and Pan Pacific Pressure Injury Alliance. Prevention and Treatment of Pressure Ulcers: Clinical Practice Guideline. Emily Haesler (Ed.). Cambridge Media: Osborne Park, Western Australia; 2014.
15. Registered Nurses Association of Ontario. (2005). Risk assessment and prevention of pressure ulcers: Toronto. http://www.guideline.gov/summary/summary.aspx?doc_id=7006#s24
16. Veterans Health Administration. VHA Handbook 1180.02 Prevention of Pressure Ulcers. http://www1/va/gpv/vhapublications/ViewPublication. asp?pub_ID=2422. Published July 1, 2011
17. Wound, Ostomy and Continence Nurses Society. (2003). Guidelines for the prevention and management of pressure ulcers. Wound, Ostomy and Continence Nurses Society: Illinois.
18. Tayyib, N., & Coyer, F. (2016). Effectiveness of pressure ulcer prevention strategies for adult patients in intensive care units: a systematic review. *Worldviews on Evidence-Based Nursing*, *13(*6), 432-444.
19. Athlin, E., Idvall, E., Jernfält, M., & Johansson, I. (2009). Factors of importance to the development of pressure ulcers in the care trajectory: perceptions of hospital and community care nurses. *Journal of Clinical Nursing*, 19(15-16), 2252-2258.

20. Langer, G., & Fink, A. (2014). Nutritional interventions for preventing and treating pressure ulcers. Cochrane Database of Systematic Reviews 2014, Issue 6. Art. No.: CD003216. DOI:10.1002/14651858.CD003216.pub2.

21. McInnes, E., Jammali-Blasi, A., Bell-Syer, S., Dumville, J., & Cullum, N. (2012). Preventing pressure ulcers—are pressure-redistributing support surfaces effective? A Cochrane systematic review and meta-analysis. *International Journal of Nursing Studies*, 49(3), 345-359.

22. Moore, Z., & Cowman, S. (2008). A systematic review of wound cleansing for pressure ulcers. *Journal of Clinical Nursing,* 17(15), 1963-1972.

23. Armstrong, D. G., Ayello, E. A., Capitulo, K. L., Fowler, E., Krasner, D. L., Levine, J. M.,…& Smith, A. P. (2008). New opportunities to improve pressure ulcer prevention and treatment: implications of the CMS inpatient hospital care present on admission indicators/hospital-acquired conditions policy: a consensus paper from the International Expert Wound Care Advisory Panel. *Advances in Skin & Wound Care*, 21(10), 469-478.

24. Beeckman, D., Defloor, T., Schoonhoven, L., & Vanderwee, K. (2011). Knowledge and attitudes of nurses on pressure ulcer prevention: a cross-sectional multicenter study in Belgian hospitals. *Worldviews on Evidence-Based Nursing*, 8(3), 166 176.

25. Cogan, A. M., Blanchard, J., Garber, S. L., Vigen, C. L., Carlson, M., & Clark, F. A. (2017). Systematic review of behavioral and educational interventions to prevent pressure ulcers in adults with spinal cord injury. Clinical rehabilitation, 31(7), 871-880.

26. Dunleavy, K. (2008). Putting a dent in pressure ulcer rates. *Nursing 2008*, 38(1), 20-21.

27. Moore, Z. (2010). Bridging the theory–practice gap in pressure ulcer prevention. *British Journal of Nursing, 19*(15), S15-S18.

28. Young, J., Ernsting, M., Kehoe, A., & Holmes, K. (2010). Results of a clinician-led evidence-based task force initiative relating to pressure ulcer risk assessment and prevention. *Journal of Wound Ostomy & Continence Nursing*, *37*(5), 495-503.

29. Bernard, M. (2002). Values as truisms: extensions and social consequences. School of Psychology Cardiff, University of Wales, Cardiff.

30. Kingston, M. J., Evans, S. M., Smith, B. J., & Berry, J. G. (2004). Attitudes of doctors and nurses towards incident reporting: a qualitative analysis. Medical Journal of Australia, 181(1), 36-39.

31. Kossover-Smith, R. A., Coutts, K., Hatfield, K. M., Cochran, R., Akselrod, H., Schaefer, M. K., ... & Bruss, K. (2017). One needle, one syringe, only one time? A survey of physician and nurse knowledge, attitudes, and practices around injection safety. American Journal of Infection Control, 45(9), 1018-1023.

32. Pakizeh, A. (2005). Basic human values: implicit structure, dynamic properties and attitudinal consequences (Doctoral dissertation, Cardiff University).

33. Patel, R. P., Gambrell, M., Speroff, T., Scott, T. A., Pun, B. T., Okahashi, J., ... & Dittus, R. S. (2009). Delirium and sedation in the intensive care unit (ICU): survey of behaviors and attitudes of 1,384 healthcare professionals. Critical care medicine, 37(3), 825.

34. Strand, T., & Lindgren, M. (2010). Knowledge, attitudes and barriers towards prevention of pressure ulcers in intensive care units: a descriptive cross-sectional study. *Intensive and Critical Care Nursing*, *26*(6), 335-342.

35. Al-Hamdan, Z., Manojlovich, M., & Tanima, B. (2017). Jordanian nursing work environments, intent to stay, and job satisfaction. *Journal of Nursing Scholarship*, 49(1), 103-110.

36. Buchan, J., Twigg, D., Dussault, G., Duffield, C., & Stone, P. W. (2015). Policies to sustain the nursing workforce: an international perspective. *International Nursing Review*, 62(2), 162-170.

37. Haloburdo, E. P., & Thompson, M. A. (1998). A comparison of international learning experiences for baccalaureate nursing students: Developed and developing countries. *Journal of Nursing Education*, *37*(1), 13-21.

38. Jose, M. M. (2011). Lived experiences of internationally educated nurses in hospitals in the United States of America. *International Nursing Review*, *58*(1), 123-129.

39. Kingma, M. (2002). Nursing migration: global treasure hunt or disaster-in-the-making? *Nursing inquiry*, *8*(4), 205-212.

40. Lusk, B., Russell, R. L., Rodgers, J., & Wilson-Barnett, J. (2001). Preregistration nursing education in Australia, New Zealand, the United Kingdom, and the United States of America. *Journal of Nursing Education*, *40*(5), 197-202.

41. Eagly, A. H., & Chaiken, S. (2007). The advantages of an inclusive definition of attitude. *Social Cognition,* 25(5), 582-602.

42. Barakat-Johnson, M., Barnett, C., Wand, T., & White, K. (2018). Knowledge and Attitudes of Nurses Toward Pressure Injury Prevention. *Journal of Wound, Ostomy and Continence Nursing,* 45(3), 233-237.

43. Beeckman, D., Defloor, T., Demarré, L., Van Hecke, A., & Vanderwee, K. (2010). Pressure ulcers: Development and psychometric evaluation of the Attitude towards Pressure ulcer Prevention Instrument (APuP). *International Journal of Nursing Studies*, *47*(11), 1432-1441.

44. Cox, J., Roche, S., & Gandhi, N. (2013). Critical care physicians: attitudes, beliefs, and knowledge about pressure ulcers. *Advances in Skin & Wound Care*, *26*(4), 168-176.

45. Florin, J., Bååth, C., Gunningberg, L., & Mårtensson, G. (2016). Attitudes towards pressure ulcer prevention: a psychometric evaluation of the Swedish version of the APuP instrument. *International Wound Journal*, *13*(5), 655-662.

46. Källman U., Suserud, B-O. (2009). Knowledge, attitudes and practice among nursing staff concerning pressure ulcer prevention and treatment-a survey in a Swedish healthcare setting. *Scandinavian Journal of Caring Sciences*, 23(2):334-41.

47. Latimer, S., Chaboyer, W., & Gillespie, B. (2014). Patient participation in pressure injury prevention: giving patient's a voice. *Scandinavian Journal of Caring Sciences*, *28*(4), 648-656.

48. Moore, Z., & Price, P. (2004). Nurses' attitudes, behaviours and perceived barriers towards pressure ulcer prevention. *Journal of Clinical Nursing*, *13*(8), 942-951.

49. Roberts, S., Wallis, M., McInnes, E., Bucknall, T., Banks, M., Ball, L., & Chaboyer, W. (2017). Patients' perceptions of a pressure ulcer prevention care bundle in hospital: A qualitative descriptive study to guide evidence-based practice. *Worldviews on Evidence-Based Nursing, 14*(5), 385-393. doi:http://dx.doi.org/10.1111/wvn.12226

50. Samuriwo, R. (2010). The impact of nurses' values on the prevention of pressure ulcers. *British Journal of Nursing*, *19*(15), S4-S14.

51. Sving, E., Gunningberg, L., Högman, M., & Mamhidir, A. G. (2012). Registered nurses' attention to and perceptions of pressure ulcer prevention in hospital settings. *Journal of Clinical Nursing*, *21*(9-10), 1293-1303.

52. Cabana, M. D., Rand, C. S., Powe, N. R., Wu, A. W., Wilson, M. H., Abboud, P. A. C., & Rubin, H. R. (1999). Why don't physicians follow clinical practice guidelines?: A framework for improvement. *Jama*, *282*(15), 1458-1465.

53. Gorecki, C., Brown, J. M., Nelson, E. A., Briggs, M., Schoonhoven, L., Dealey, C., ... & Nixon, J. (2009). Impact of pressure ulcers on quality of life in older patients: a systematic review. *Journal of the American Geriatrics Society*, 57(7), 1175-1183.

54. Kalisch, B. J., Landstrom, G., & Williams, R. A. (2009). Missed nursing care: errors of omission. *Nursing Outlook*, *57*(1), 3-9.

55. Kalisch, B. J., Tschannen, D., Lee, H., & Friese, C. R. (2011). Hospital variation in missed nursing care. *American Journal of Medical Quality*, *26*(4), 291-299.

56. Odierna, E., & Zeleznik, J. (2003). Pressure ulcer education: a pilot study of the knowledge and clinical confidence of geriatric fellows. *Advances in Skin & Wound Care*, *16*(1), 26-30.

57. Suen, W., Parker, V. A., Harney, L., Nevin, S., Jansen, J., Alexander, L., & Berlowitz, D. (2012). Internal medicine interns' and residents' pressure ulcer prevention and assessment attitudes and abilities: results of an exploratory study. *Ostomy Wound Manage*, *58*(4), 28-35.

58. Tallier, P. C., Reineke, P. R., Asadoorian, K., Choonoo, J. G., Campo, M., & Malmgreen-Wallen, C. (2017). Perioperative registered nurses' knowledge, attitudes, behaviors, and barriers regarding pressure ulcer prevention in perioperative patients. *Applied Nursing Research*, *36*, 106-110.

59. Kalisch, B. J. (2006). Missed nursing care: a qualitative study. *Journal of Nursing Care Quality*, *21*(4), 306-313.

60. Lewin, G; Carville, K; Newall, N.; Phillipson, M.; Smith J; & Prentice, J. (2003) Determining the effectiveness of implementing the AWMA Guidelines for the prediction and prevention of pressure ulcers, in Silver Chain – a large home care agency. Stage 1: baseline measurement. *Prim Intent*, 11: 57–8, 60–7, 69–72.

61. Pieper, B., & Mott, M. (1995). Nurses' knowledge of pressure ulcer prevention, staging, and description. *Advances in Wound Care: The Journal for Prevention and Healing*, *8*(3), 34-38.

62. Levine, J. M. (1992). Historical perspective: the neurotrophic theory of skin ulceration. *Journal of American Geriatric Society;* 40:1281-3.

63. Gunningberg, L., Lindholm, C., Carlsson, M., & Sjödén, P. O. (2001). Risk, prevention and treatment of pressure ulcers–nursing staff knowledge and documentation. *Scandinavian Journal of Caring Sciences*, *15*(3), 257-263.

64. Shahin, E. S., Dassen, T., & Halfens, R. J. (2009). Pressure ulcer prevention in intensive care patients: guidelines and practice. *Journal of Evaluation in Clinical Practice*, *15*(2), 370-374.

65. Tescher, A. N. (2017). Pressure Injuries: Prevention That Works. The Joint Commission. Strategies for Preventing Pressure Ulcers, Joint Commission Perspectives on Patient Safety, Volume 8, Number 1, January 2008, pp.5-7(3). http://www.jcrinc.com/Pressure-Ulcers-stage-III-IV-decubitis-ulcers/.

66. Hopkins, A., Dealey, C., Bale, S., Defloor, T., & Worboys, F. (2006). Patient stories of living with a pressure ulcer. *Journal of Advanced Nursing*, 56(4):345-53.

67 Downie, F.; Guy, H. Gilroy, P. Royall, D., Davies, S. (2013). Are 95% of hospital acquired pressure ulcers avoidable?. *Wounds UK. 9*(3), 16-22.

68 Black, J. M., Edsberg, L. E., Baharestani, M. M., Langemo, D., Goldberg, M., McNichol, L., & Cuddigan, J. (2011). Pressure ulcers: avoidable or unavoidable? Results of the national pressure ulcer advisory panel consensus conference. *Ostomy-Wound Management*, *57*(2), 24.

69 Reducing Hospital-Acquired Conditions. Content last reviewed December 2017. Agency for Healthcare Research and Quality, Rockville, MD. https://www.ahrq.gov/hai/hac/index.html

70 Van Den Bos, J., Rustagi, K., Gray, T., Halford, M., Ziemkiewicz, E., & Shreve, J. (2011). The $17.1 billion problem: the annual cost of measurable medical errors. *Health Affairs*, *30*(4), 596-603.

Ethnography of Critical Care Nurses' and Providers' Attitudes Toward Pressure Injury Prevention in Intensive Care Units

Objective: To elucidate attitudes of critical care nurses (CCRN) and providers (physicians and nurse practitioners) regarding pressure injury prevention (PIP) in intensive care units (ICU).

Background: PIs inflict human and financial costs on individuals and health care systems by increasing length of hospital stays, disability, and need for long-term treatment.[1-3] At high risk are ICU patients who disproportionately suffer from PIs. The fact that avoidable PIs persist in ICUs despite of interventional studies and clinical guidelines indicates that the phenomenon must be approached differently. The attitudes of CCRN and provider stakeholders toward PIP in the ICU are vastly underexplored.

Methods: Focus groups and interviews, stratified by stakeholder groups, were held at four hospitals in Southern California. Focused ethnography was used as the research method and data collection and analysis were guided by grounded theory analytic techniques to reveal implicit and explicit beliefs, practices, and interactions about PIP. Using Atlas.ti version 8.4.4 (1135), an iterative process of coding, sorting, categorizing, and constant comparison was used to reveal categories.

Results: Preconceptions held by CCRN and provider stakeholders are that PIP tasks are a high priority in ICUs and that most ICU patients can benefit from PIP. Misconceptions prevailed including beliefs that highly critical patients are unable to tolerate any PIP, PIP mostly consists of turning side-to-side at various intervals, and PIs take longer to develop than scientific evidence suggests. These attitudes impacted how stakeholders interpreted transition points in the ICU and hence how they prioritized their subsequent tasks.

Discussion: Study findings can strengthen accurate preconceptions and to improve PIP programs in health care organizations that counter misconceptions. These insights can also inform both medical and nursing school curricula to start or improve evidence-based instruction on PIP. By focusing on professional schools, accurate preconceptions can be formed instead of correcting misconceptions once they are ingrained. This however requires a culture shift, especially so in the provider stakeholder group.

Conclusion: Findings of this study support the need for exploring potential human factors that impact approaches to PIP in the ICU. Findings can inform health care professionals, organizations, and professional schools' decision making around PIP.

Introduction

Pressure injuries (PIs) are a complex and multifactorial phenomenon and a leading cause of avoidable harm.[4,5] Although the rate for all hospital acquired conditions, such as injuries from falls, has decreased eight percent from 2014 to 2016, the rate for hospital acquired pressure injuries (HAPI) has increased.[6] The HAPI rate may be substantially higher than commonly reported according to recent studies.[7] The majority of PIs are deemed preventable which means that most PIs are considered medical errors.[8,89] Among medical errors, PIs are associated with the largest annual measurable cost.[8] HAPI prevalence rates in ICUs are the highest among hospitalized patients ranging from 14 percent to 43 percent.[9-13]

Most research has focused on risk assessment, equipment, reduction of friction and shear, and nutrition.[14-17] Additional research has focused on nurses' education and knowledge of PIP, although improved knowledge has not been linked consistently with improved care.[14,18-21] Researchers and health care organizations must explore other potential contributing factors, such as attitudes and values as predictors to behaviors relating to PIP. Studies in other fields have found that attitudes affect a person's behavior such that they have an observable behavioral pattern consistent with their values.[22-25]

Rahimi, Bates-Jensen, Pavlish, Hodge, and Benharash (2019)[26] conducted a comprehensive literature review on nurses' and providers' attitudes regarding PIP. In brief, their findings revealed that of the 14 studies[39-52] exploring PIP attitudes of nurses, ten were conducted outside of the United States and only one focused solely on critical care nurses (CCRNs)[51]. Rahimi et al.'s (2019)[26] literature review results indicated that most nurses had positive attitudes regarding PIP yet others viewed it as a low status and low priority responsibility to be delegated to assistants.[44,49,50] Even if they valued it, nurses exhibited behaviors detrimental to skin health,

such as turning patients at intervals greater than evidence suggests.[44] Nurses also thought that in spite of a knowledge deficit, physicians were ultimately responsible for PIP but that they were only interested if an injury led to litigation.[26]

Rahimi and colleagues' literature review (2019)[26] returned four studies on providers' attitudes about PIP.[27-30] One study was conducted with ICU providers and none with providers other than medical doctors.[29] Only two explored attitudes directly.[28,29] Most physicians thought their education did not prepare them adequately for PIP. Less than half could identify the most widely used skin risk assessment tool, and 52 to 67% staged injuries correctly. Still they felt justified to hold teaching positions educating physicians and other disciplines on PI.[27,29]

While research on provider and nurse attitudes regarding PIP is scarce, studies that focus on these stakeholders in the ICU are even more limited and especially so in the United States. This glaring gap in the literature makes evident the need for exploring human factors, such as attitudes, which inform behavioral patterns. The objective of this study was to explore and reveal the attitudes of nurses and providers about PIP in ICUs. Findings of this study will inform future approaches to managing PIP in ICUs.

Methods

This study was part of a larger ethnographic study to examine attitudes toward PIP in ICUs among CCRNs, providers, administrators, patients, and family/caregivers. Only findings related to CCRNs and providers are reported in this paper. The Office of the Human Research Protection Program at the University of California, Los Angeles approved the study. The investigators obtained informed consent to participate in the study directly from participants prior to conducting interviews or participating in focus groups.

Framework

Focused ethnography, using analytic techniques of grounded theory, guided this study. Concerned with beliefs, practices, and interactions about[33] a specific phenomenon in everyday life, a process-focused research question, presented by the literature, is targeted.[34,35] Data collection focuses on specific target participants and situations to provide for context. Hence, familiarity and background knowledge of the field are necessary to conduct focused data collection, such as interviews and focus groups with specific participants, via short-term field visits.[33] Investigators often move across different settings for data collection to gain more insights of processes around the phenomenon of interest.[31-33] Grounded theory analytic methods render a conceptual rendering of the beliefs, practices, and interactions by approaching data collection and analysis systematically.[32] Rather than relying solely on field notes, audio-visual recordings are used. As such, multiple researchers can be exposed to the data in their original and unaltered ways eliciting analysis from independent reviewers and therefore decreasing researcher bias.[33] Investigators also explore literature about the phenomenon alongside data collection as a form of data to support emerging explanations of the study's focus.[32]

Setting and Sample

A CCRN and a nurse academic and clinical researcher were the investigators. The research team also included one research assistant. Four hospitals, two community-based organizations and two academic organizations, provided the setting for the study. To gain access, the investigators met with the hospitals' nursing and research administrations. ICU staff meetings and email communication were used consequently to introduce the investigators and to provide further opportunities to pose questions. Subsequent flyers were left in ICU waiting rooms, staff lounges, and with administration. Interested participants contacted the principal investigator via phone or email, were screened for eligibility, and were scheduled for focus

groups or interviews. CCRNs were eligible if they were at least 0.5 full-time equivalent staff, were not traveler or registry nurses, and had at least one-year ICU experience. Providers were eligible if they were medical doctors, physician assistants, or nurse practitioners, and if their capacity in the ICU was beyond single consultations.

Data Collection

The investigators were a CCRN and an expert in pressure injuries and hence were familiar with the milieu. As such, they did not have to be immersed in the field for extended periods to become familiarized. [31-33] Depending on participant preferences, focus groups and interviews were conducted in person in private rooms or by phone and lasted 20 minutes to 130 minutes with an average of 60 minutes. Interviews were held with a maximum of two participants and focus groups with a minimum of three and a maximum of nine participants.

The investigators developed semi-structured interview guides for each stakeholder group based on a comprehensive literature review.[36-38] The guides were informed by the investigators clinical experience, and in consultation with qualitative research experts. The guide was dynamic, because it was informed by insights gained and questions raised with each participant encounter and the consequent analysis of the data. The interview guides were piloted in practice interviews with a physician, a family and patient dyad, and two nurses. Based on findings and the pilot group's feedback, the guides were refined. All interviews and focus groups were directed and conversational such that participant responses guided the conversation and which questions would be posed next. A brief interview guide with sample questions (Table 1) provides insight into the data collection approach during interviews and focus groups.

Table 1. Brief Critical Care Nurse and Provider Interview Guide

Critical Care Nurses	**Providers (Physicians/Nurse Practitioners)**
Thinking about your daily routines, what role do skin health and pressure injury prevention play in your workflow?	
What would increase or decrease the importance of pressure injury prevention for you?	
What is your sense about what priority *your ICU*, not you, gives to pressure injury prevention as a unit?	
What is your experience with pressure injuries in the ICU during your career?	
Remember pressure injuries you encountered in your ICU career that were deemed preventable. What or who stood in the way of preventing those?	
What is your role in the prevention of pressure injuries in the ICU, if any?	
What have you been observing or noticing in how pressure injury prevention is approached that could still improve?	
What goes through your mind when a HAPI happens in your ICU?	
What is the process once a HAPI is discovered?	
What are the consequences, if any, for you and for others once a HAPI occurs?	
	What makes pressure injuries medical errors?
How have you seen ICU providers address pressure injury prevention?	How have you seen other ICU providers address pressure injury prevention?

All focus groups and interviews were recorded on five recorders for data safety and clarity, were transcribed verbatim, and de-identified at both hospital and individual level. Concerns for confidentiality were expressed several times when participants felt they were disclosing socially undesirable information, or when they felt statements may reflect poorly on themselves or others. Repeated assurances were made throughout the process. The subject pronouns *he* and *she* were merged to *s/he* to add another level of confidentiality. Also, all participants were given the option to review the recordings. If they had taken part in an interview, they had the option to request partial or complete deletion. No participants made review or deletion requests.

Data Analysis

All interview and focus group transcriptions were imported into Atlas.ti version 8.4.4 (1135).[55] Once imported, transcripts were read and reviewed by the investigators, an inductive and iterative process of coding, sorting, categorizing, and constant comparison were used to reveal categories.

Analysis was guided by the analytic techniques of grounded theory as outlined by Charmaz (2006).[32] Using Atlas.ti version 8.4.4 (1135)[55], data were coded inductively line by line to avoid imposing preconceived notions and to avoid becoming immersed in the respondents' worldviews without questioning them.[32] This close-to-the-data approach allowed the investigator to formulate questions for what data to collect next. Second phase of analysis involved focused coding whereby the most frequent and/or significant codes were used to review larger data segments. This step condensed data which yielded potential categories to encompass data of similar meaning. Doing so allowed comparing experiences, actions, and interpretations across interviews and focus groups. Categories may encompass several codes and explicate ideas, events, or processes in the data. Where categories appeared thin, purposeful theoretical sampling

was used to complete properties in line with the developing explanation. Saturation was reached when additional data did not inspire new insights. Theoretical coding then specified possible relationships between categories.

Memo writing was an important analytic tool employed throughout. Various forms of diagrams were used to elaborate central processes integral to analysis. At all analytic levels the constant comparative method was applied. Part of the constant comparative method was the iterative return to data for comparison to ensure that all analysis was still grounded in the data. A second person was intimately immersed in the data and reviewed emerging categories.

Results

A total of 41 CCRN and provider stakeholders participated in interviews (n=12) or in one of four focus groups (n=29). CCRNs were all female (n=26), had a mean age of 40 years $\pm$ 15 years, identified with predominantly white (50%, n=13) and Asian (42%, n=11), had an average ICU experience of 13 years $\pm$ 13 years, with 54% from community hospitals. The majority of providers (n=15) were male (67%, n=10), had a mean age of 44 years $\pm$9 years, were predominantly white (53%, n=8), had an average ICU experience of 9.6 years $\pm$8 years ICU with 27% from community hospitals. There was one Nurse Practitioner (NP) in the provider group with the remaining providers all physicians. Where physician and NP providers showed agreement in the data, the term *provider* is used. Where physician and NP providers differed, the terms *physicians* and *NP* are used. Table 2 presents participants' demographic data.

An explanation of *struggling to integrate PIP in the ICU* captured the overall experience and process that providers and CCRNs encountered in their day to day life in the ICU. Three independent conceptual categories sat within this explanation and reflect how stakeholders maneuvered integrating PIP in their dynamic workflow. These conceptual categories were

preconceptions, transition points, and prioritizing. Preconceptions affect attitudes of individuals and groups and the decisions they make at all times. How transition points in the ICU are interpreted and acted upon are therefore influenced by such preconceptions. Providers and CCRNs then set priorities based on such decisions. Processes of interpreting transition points and setting priorities position providers and CCRNs on a continuum between engagement and disengagement with PIP. A process map of the conceptual categories is depicted in Figure 1.

Preconceptions and Misconceptions

Preconceptions are persistent ideas and opinions that occur prior to events or transition points. Persons interpret and integrate information differently based on preconceptions and find that their behaviors, judgment, and communication are affected. Similar past experiences influence expectations of upcoming events or transition points. In this study, existing ideas which agree with scientific knowledge and also those that cannot be categorized into accurate or inaccurate, are termed preconceptions. For example, there are different preconceptions about the extent to which stakeholders are responsible for preventing PIs in the ICU with some believing that PIP is a multidisciplinary responsibility while others have the misconception that only nursing is responsible for PIP. Misconceptions, therefore, are preconceptions that are incompatible with currently accepted scientific knowledge which mostly form during and after formal instruction in the topic has taken place.[56] How preconceptions and misconceptions of providers and CCRNs affect their interpretation of events in the ICU will guide them closer to engaging or disengaging with PIP by informing how they prioritize their tasks.

Unavoidable PIs. Both CCRNs and providers reported preconceptions regarding unavoidable PIs. Although some had the underpinnings of current scientific understanding, most were misconceptions. The most common misconception by CCRNs was that hemodynamically

unstable or otherwise very critical patients could not tolerate any movement. The state of hemodynamic instability was mostly reported as three or more vasopressors to support blood pressure and as fluctuations with oxygenation associated with movement by both stakeholders:

> "When we have pressors and you can't even lift a finger […] just lifting the hand or touch their skin, the pressure drops." (RA4)
>
> "Patients who are that hemodynamically unstable that they are on 3 or 4 pressors, it's probably safe to say they aren't being routinely turned." (PA2)

In contrast, some CCRNs who correctly believed that PIP was still possible with critical and hemodynamically unstable patients. These CCRNs elaborated on how to weight shift and how to move tissues on such patients and explained that vigilance with PIP was most important in this patient population.

Aside from hemodynamically unstable patients, some CCRNs and providers expressed certainty about other categories of patients who would suffer PIs regardless of efforts. Some of these categories were patients with lasting diarrhea, "bad skin" (PA4), on steroid, with tracheostomies, bilevel positive airway pressure masks (BIPAP), at the end of life or on comfort measure, high-level cervical fractures with collars, other invasive devices, and patients and families who were noncompliant with PIP. Some CCRNs had an accurate perception in that the placement of devices or the care of patients in these groups could be tailored such that PIP could be performed. An example was providers who consulted with the bedside nurse during a procedure to learn whether the manner of placement and suturing of a tracheostomy was conducive to PIP and to other care. This accurate preconception was also noted by one provider.

Understanding of PIP. The CCRNs' and providers' understanding of PIP became mostly evident in their rationalizations of why and how critical patients could or could not

benefit from PIP. As with the subcategories of *unavoidable PIs*, most of the data related to an *understanding of PIP* indicated misconceptions. There were three main misconceptions identified in the data related to an *understanding of PIP*, 1) PIP only involves turning and turning must be at 90-degree rotations, 2) frequency of repositioning, and 3) time for PI development.

A common misconception was that PIP consisted only of turning and that turning entailed 90-degree rotations and this was true of both CCRNs and providers. Most providers and CCRNs were insistent in their viewpoint and were unaware or not accepting of alternatives to attempting extreme turns with their unstable patients. When alternative methods, such as micro-turns and weight-shifting were suggested by a CCRN participant in three different focus groups, on two occasions the suggestion was abruptly refuted with annoyance by other participants. Physician providers, more than CCRNs, believed that side-to-side turning was the only PIP intervention. CCRNs and physician providers reinforced and followed each other's recommendations or orders to not turn when they did not have guidance on alternative PIP interventions. Some physician providers expressed their misconceptions with frustration at CCRNs which were based on previous experiences that associated mobilizing with decompensation: "It's actually sometimes annoying to get a call from the nurse saying that 'Oh I tried to move the patient and he's satting in the 60s', so what more can you do then?" (PC2)

A misconception held by physician providers only was about the recommended frequency of repositioning patients. Physician providers either did not know or thought the frequency of repositioning was. three, four, or 12 hours. Some did not think it problematic to order complete patient immobility for up to 72 hours or even longer.

Another misconception surprisingly held by both CCRNs and physician providers was the length of time required for PI development. One physician provider responded that there was

more important information to worry about (PA3) while another thought PIs developed quickly which meant within a few days (PC1). CCRNs' responses ranged from no answer to hours to several days.

CCRN conceptions of ICU providers. It is important to be aware of the CCRNs' perceptions of their ICU provider colleagues, because they may affect how transition points are interpreted and consequently how priorities are set. The majority of CCRNs assigned the primary responsibility for PIP with nursing but thought there should be greater awareness with other disciplines, including physicians. They perceived physicians to only be interested in PIs when they actually happened: "I would say that a good 90% of our physicians really don't care" (RNC2). All CCRNs thought physicians had significant PIP knowledge deficits. The CCRNs felt that empathy for nurses was lacking and that the burden of PIP was often not realized or ignored by providers. CCRNs reported being "shocked" (RNA1) when a physician offered to help move a patient for a procedure because almost all providers typically ordered nurses to reposition the patient, left the room, or stayed in the room and watched while the nurse repositioned the patient: "I don't think they realize how big and difficult of a thing it can be." (RNA1)

While CCRNs viewed providers as detached from anything PIP-related, many still perceived PIP to be a multidisciplinary phenomenon which included providers with tasks like ordering vitamins and placing timelier mobility orders. Two CCRNs thought that providers had an active and, at times, even proactive role (RNA4). All except two CCRNs were not surprised to learn that providers did not see themselves to have an active role. Other CCRNs reported that providers took instructions regarding PIP well (RNA2, RNC3). Where checklists were used during rounds, CCRNs reported that providers asked if there were any skin-related concerns.

ICU provider conceptions of CCRNs. The majority of providers' conceptions of CCRNs was that nurses were responsible for PIP. The providers did not view themselves to have an important role in preventing PIs and were satisfied with how prevention was approached the ICU. Providers trusted CCRNs and hoped to be even less involved in PIP. There were few providers who had an actual perception of the daily processes in the unit that related to PIP and these providers thought that PIP was only the turning, lifting, and cleaning that nurses performed. Providers believed that CCRNs tried to turn all patients regardless of stability. Some providers did not approve of this approach. Only one physician provider's perception was that the provider's role was to ensure that nurses were paying attention to skin while also admitting that physicians neither had the knowledge nor the time to concern themselves with prevention. Only the NP provider perceived that all stakeholders needed to be more invested in PIP. His/her perception was that CCRNs needed to pay closer attention to how they placed and maintained supplies and devices and how the patient was positioned. None of the providers blamed nurses for PIs.

Transition Points

It is the nature of the ICU that all stakeholders undergo numerous transitions throughout their time in the unit. Transitions may be desired or not and by design or not. Some are routine and expected changes while others can alter the course of treatment, behavior, and thinking. For example, hand-off reports to the next shift are routine transitions, but even these can become non-routine if they coincide with other transitions, such as a patient coding during the report. Other changes are role transitions that both providers and CCRNs live as they care for patients who might have vastly different needs. Where on the gradient the CCRNs' and providers' responses fall depends on a multitude of factors including patient assignments, acuity,

experience, preconceptions, etc. Subcategories which make up the conceptual category of *transition points* are discussed in more detail.

Disrupting factors. The meaning that individuals and the micro-culture give to disrupting factors can make for a smooth or a difficult transition for anyone involved. CCRNs and providers can leverage disrupting events or processes to engage patients and families with PIP and to tailor PIP activities to meet their patients' needs which was reported by few. CCRNs and providers can rationalize such events or processes to disengage from PIP which was echoed by most. Being overwhelmed in the ICU is often associated with patient and family experiences. However, the many demands that are placed on providers and CCRNs can be overwhelming and can result in deprioritizing some aspects of care. The competing priority that was echoed most frequently as blocking PIP was hemodynamic instability or patients being too unstable to tolerate repositioning. Some physician providers and CCRNs perceived a patient's critical status as a justified disrupting force to PIP. One physician provider even reinforced the disruption by writing orders for nurses not to move patients, such as those with acute respiratory distress syndrome (ARDS) for up to 72 hours. This reinforcement of PIP disruption by ordering immobility was supported and triangulated in other interviews and focus groups:

> "It's a matter of life and death, you know, from hypoxia. So, until they are stabilized from a respiratory standpoint, I tell the nurses[…]I try to put in orders […] DO NOT MOVE the patient. […] But that is, you know, very temporary. 24- to 48 to 72 hours." (PC1)

Some providers noted that PIP had a low priority and was forgotten unless someone reminded them. One provider was actually hoping for a disrupting force that would disengage providers even further:

"If there were more protocols in place, so that I wouldn't have to constantly think about and remember to say and write orders […] the lift team comes and moves patients, but if there were more of those [protocols], then my role would become less important." (PA4)

Other times, providers admitted that at transition points, where they perceived patients would not tolerate repositioning, they gave verbal orders not to do so. Yet, they were unwilling to provide written orders. The physician providers in the following excerpt were becoming aware of what this transition meant for all involved by the end of the exchange. The providers were clearly aware that documenting their decision might have negative consequences for them but they were expecting the nurses to accept the burden. It was already known from this focus group that the participating physician providers desired to have an even lesser role in PIP:

"MD3: No, we don't really write an order for that. They try and it doesn't work and we just tell them to not do it anymore.

MD4: I've been asked though to write an order to not turn a patient […] if we told them to stop turning, they asked for an order

MD8: Yeah, I'm not comfortable with that.

F: with what?

MD8: with writing an order for that

F: if you tell them not to turn a patient, why not write an order to confirm it?

MD8: It's not that I tell them not to turn. They come to me and say Hey, I turned, patient desaturated, and I go, well then don't do it." (PA3)

While the above providers and CCRNs accepted the critical state of patients as a disrupting force to not perform PIP activities, there were a few others who realized these events as opportunities to tailor PIP interventions instead of ceasing them:

> "There's tools to help us when they're that unstable. Equipment and optimize nutrition […] So, we get some positional changes in but we've not been able to go beyond 5 or 10 minutes of repositioning or bathing." (PA1)

> "I think it's all the more important when the patient is hemodynamically unstable because that's the time when the nurses are not going to turn their patients and that's when they're 100% going to get the pressure ulcer […] what will happen is that the pressure ulcer will develop and from there you get sepsis and he's going to become even more hemodynamically unstable." (RC1)

Expectations. Providers and CCRNs largely know what to expect in the ICU because of their training and their experience. Reasons for differing expectations are level and type of experience and also whether previous encounters were positive or negative. Expectations may or may not be accurate and in line with current science. When one has an expectation for a transition, such as a PI to happen, it may alter their attitudes toward subsequent actions and decisions: "a lot of times, the patients come in debilitated already with very poor protoplasm, so it's almost like difficult to prevent sometimes." (PC2)

Depending on the weight of expectations, when they are not met, the consequences can be substantial. When consequences should be significant to induce a change in behavior, but they are not, habits are formed and systems issues can develop. The following excerpt demonstrates how, during a transition period for patients with PIs under treatment, there are unmet expectations of CCRNs causing patient harm:

> "there's not explicit documentation or nursing instruction with that order. They [nurses] get critiqued for not doing it the way the expert wants it to be done. But they're not the expert! 'I assumed you were following the instructions as written', but with changeover of staff and handoff, person to person to person, the skin suddenly being broken could happen. And someone would say: Well, it must have been like this, so, let's just continue. So, things snowball relatively quickly with wounds." (LC2)

Providers have come to mostly expect a lack of consequences for disengaging with prescribed PIP practices in various ways. Experiencing no consequences repeatedly has led to habit formation which providers freely admitted. When providers were asked about a habit of documenting skin to be intact in spite of extant PIs, physician providers confirmed that they did not perform skin assessments as required. They were aware of the expectation but deflected it to nursing, because it was not realistic, and because patients were too difficult to mobilize, they explained. Others reported and confirmed that they did not fulfill the regulatory expectation but did document they had done so in both notes and billing:

> "You are required to go through a certain number of systems for an assessment in order to get paid. And so, one of the ways to get around it is to say Oh yeah, their skin is intact, because we looked grossly at their skin when I assessed him, not necessarily doing a detailed assessment. Which is hard to say, right, because we know that pressure ulcers are typically not on their chest or face. It is disingenuous and it doesn't necessarily have anything to do with the physician's ability to do pressure ulcer assessments; it has to do with trying to get another system in so that you can bill for whatever level of care that is[…] and then you

> are billed for a lower level of care, because you only checked 3 systems. Then yes, we'll throw in a system that says like Skin Intact, right. because that's how you have to play the system […] You know skin has to kinda be that afterthought."(PA3)

Other providers reported and agreed that if there was a real expectation of providers to have skin health responsibilities, then those providers would have to be freed up completely from other obligations. This attitude indicates that providers do not favor a multidisciplinary approach to skin health but rather all-or-none scenarios:

> "I mean unless, you really want to hire doctors to be taking care of these things for you, it doesn't seem very likely that they would staff for it […] I would have to give up all my practice to do stuff like that. So, you'd almost have to, have a physician full-time to be doing things like this for the hospital." (PC2)

Level of knowledge and skill. Providers and CCRNs are trained to have the knowledge and skills to maneuver transitions that occur in the intensive care setting. However, not all transitions in this setting are covered by training and depending on work experience, knowledge levels and skills differ. CCRNs explained that hospitals sometimes have to invest scarce resources into completing training gaps which delays specialty ICU training or leaves it incomplete. Providers indicated that they received minimal PI training which was a long time ago or none at all which was also echoed by CCRNs.

The increasing lack of foundational training in CCRNs' professional education was addressed frequently. Great frustration about nursing schools failing ICUs and their patients was reported. Some CCRNs imagined being under the care of newer generations of nurses to be a frightening thought. Some CCRNs perceived that shift occurred over the last ten years and

explained that CCRNs now were proficient at electronics and documentation but were unable to perform basic and essential nursing tasks. They were also unable to connect and build rapport with patients and families.

> "I feel the nursing schools are not preparing this generation to be effective at the bedside. I think there are a lot of gaps in nursing education. It's sort of how can we get them through as quickly as we can […] the biggest challenge for us is to see what was your gap in nursing school and then we have to get them like the mouth care, the skin care, that kind of stuff, we honestly, as a unit, have may like 3 weeks to teach them that." (LA3)

If, in addition to being novice, the CCRN staff does not have a supportive work environment that can guide them through these transition points, the CCRN may actively avoid unfamiliar and uncomfortable circumstances. For example, CCRNs were reported to avoid performing PIP, because they were fearful of being blamed for patients deteriorating when being repositioned, especially so if families were present.

An NP provider described how effective training can instill a sense of responsibility for preventing PIP even when not a bedside nurse. The NP's training started early, was repeated, and therefore became ingrained. Because of a strong foundation, the NP has been able to tailor PI-relevant knowledge to various contexts and work environments. S/he also expressed frustration with CCRN and provider colleagues for not paying more attention to preventing tissue injuries better, especially in cases where only small efforts have to be exerted, such as rectal thermometer placements.

Temporary nurse staff also pose an issue related to level of knowledge and skills. Having a high rate of traveling or registry nurses, especially so in the ICU, may indicate systems issues,

such as high turnover and frequent unscheduled and short-notice call-outs. All health care organization and units have their own micro-culture and expectations. By nature, non-permanent staff passing through the system cannot be acculturated and may not be as invested in the positive outcomes of care as their permanent colleagues as CCRNs and leaders explained. Even if the temporary nurse had extensive knowledge, leaders noted that their practice could not align fully with the hospital's expectations and that they mixed practices. They were also concerned that temporary staff were not accountable to anybody which explained severe PIs and higher incidence rates when the number of non-permanent staff increased.

Prioritizing

The conceptual category of prioritizing emerged consistently with all providers and CCRNs and was the primary reason for engaging or not engaging with PIP. In an acute environment where time scarcity is a daily reality, prioritizing one's focus and tasks becomes critical. Decisions on implicit rationing have to be made about what tasks to complete and what will be left unattended or unfinished. Most CCRNs and providers were aware that they missed care, at times or even frequently, but did not acknowledge the same without being asked. Mechanisms that affected prioritization were categorized into five different categories Implicit: effect on airway, breathing, circulation (ABCs), measurable/visual outcomes, time investment, group norms, and audits.

Effect on airway, breathing, circulation (ABCs). In the ICU, patients with severe or life-threatening illnesses or injuries are under close observation and are treated by specialized staff with a higher staff to patient ratio and increased technology. Often, in rapid succession, nurses and providers have to make multiple decisions to stabilize a patient while still maintaining clarity and compassion with patients and families. As such, by training, CCRNs and ICU

providers have to prioritize their focus to attend and to meet these competing demands. ABCs are commonly known as the highest priority in the ICU environment and are emphasized greatly in training as was echoed in the data. Both stakeholder groups asserted that during transition points interpreted as cases of ABCs, stabilizing the patient was paramount and their primary priority under all circumstances. Curiously, both providers and CCRNs sometimes treated ABCs and PIP as mutually exclusive processes. They also explained that in some cases, the ABCs remained critical for several days not permitting any PIP to take place.

Measurable and/or visible outcomes. Most tasks that are commonly perceived to be PIP, such as turning, keeping patients clean and dry, maintaining wrinkle free linens, reducing number of layers, and avoiding shearing forces are not readily measurable and visible. Other tasks that are also PIP related but are not commonly thought of as such are mostly under the providers' purview and are more measurable, such as lab orders for prealbumin, albumin, vitamins, nutritional consults, and specialty surfaces. However, if provider awareness and engagement with PIP are low while the measurable tasks are not part of order sets, these tasks are not routinely performed. In an environment where stakeholders are on high alert, where progress reports and plans of care have to be communicated frequently, and where time is a scarce resource, often the not easily visible tasks can be delayed or not completed. The following provides examples of how staff delayed or eliminated PIP tasks in favor of other measurable and visible tasks.

CCRNs reported that visual skin handoffs were protocol, but they were not performed. Instead a verbal report was accepted. The common practice was to wait for the lift team in order to visualize patients' skin. Other CCRNs admitted that the reason for PIs developing was not insufficient resources and that, in fact, they had abundant resources. Some CCRNs reported that

sometimes a lack of diligence with skin assessments which was the reason PI development or worsening before the next shift. It was easier to put PIP on the "backburner" to attend to other priorities (RA1). Still others, including the NP provider, reported CCRNs often did not think of assessing under medical devices, such as casts, collars, and nasogastric tubes. Another PIP task that was reported as being delayed for hours was assessments before morning rounds which also entailed repositioning patients. This meant that patients would frequently remain in the same position for several hours, because CCRNs needed to ready themselves to present other priorities during rounds if the attending physician inquired. Hence, the nurse would accept the previous shift's report on skin condition. Providers reported to write mobility orders but that they sometimes forgot to update those. Sometimes CCRNs would not question such outdated orders leading to patients remaining bedbound for several days which further deconditioned them.

When PIs are present on admission, but they are not documented, the missed care of the skin assessment by the ICU provider becomes very visible and is always measurable. Still providers admitted freely that they did not perform skin assessments or did so superficially, while falsely documenting that they completed them. They rationalized that they had higher priority tasks.

Time investment. Each ICU staff member has limited time to meet many demands during a shift. Hence, tasks that were time intensive and not always measurable or visible were reported to be delayed or omitted more frequently by both CCRNs and providers. Completing shift reports without skin handoffs, getting ready for ICU rounds in the morning without repositioning patients and without assessments, entering patients' rooms with incomplete supplies because they were too scattered, and forgoing checking under medical devices were some examples CCRNs provided they were engaged in.

Some CCRNs pretended not to see PIs on their patients to avoid lengthy and cumbersome paperwork and to avoid having to "play a detective" while they still had to attend to all their other duties: "So, it's like: Oh, I don't really see it! No, I don't see it! I'm pretending that I don't see it! But they know it's there!"(RC2). This process was reported to be even lengthier and therefore avoided because resources like printers and cameras were not always working.

CCRNs also noted that once they ensured that their patients' ABCs were under control, they would consider thinking about PIP, because the competing demands all took time. When nurses were assigned to a single highly critical patient, sometimes they "could take more time, and be diligent on taking care of skin needs. All the way around instead of just critical things" (RC2). CCRNs indicated that skin assessments and other PIP activities were time-intensive tasks. One example was that nurses knew when nutritional consults and specialty surfaces were necessary, but had to go through the provider to get these ordered. Reaching them and eventually obtaining the order could take a long time. Therefore, they wished for ways to make all skin health activities more convenient, efficient, and less bothersome for all involved.

Providers acknowledged a lack of training and preparedness relating to anything PI-related. Yet, most also admitted they would not be interested in attending any educational opportunities if their organization provided them, because that time could be spent otherwise and because they had their schooling already. One physician expressed interest if credits were offered.

Group norms. CCRNs with 15 or more years of experience reported a culture shift. They remembered relying on comradery for challenging tasks like repositioning and bathing. The CCRNs' priority for new generations had changed to peer socialization, cellphones, and good charting which did not reflect the actual care given. Communication skills had suffered in

exchange, they reported. At hospitals that had lift teams, it had become a norm to expect the lift team to reposition patients even if the lift team did not arrive timely several CCRNs reported. Group norms had shifted to completing patients' most basic needs quickly instead of taking pride in one's work. On the other hand, some younger CCRNs described how within their group of peers they were comfortable asking for assistance with repositioning, but they did not feel as comfortable with their more experienced colleagues.

Another group norm is the prioritization of physician orders or tasks, such as ad hoc orders to reposition patients for a procedure. CCRNs had to reposition patients by themselves or try to recruit helpers. With resource constraints, neither safe repositioning for the patient nor safe body mechanics for the staff are a priority resulting in potential negative outcomes, such as increasing shearing forces to the tissues.

Collaborating in a true multidisciplinary manner is only an emerging group norm in practice that was evident in some provider reports. A CCRN explained and others agreed that, on rare occasions, some providers assisted them in repositioning patients when they gave the order to do so for procedures. Another provider described consulting with CCRNs about placement of invasive lines and tracheostomies, for example, that may impact PIP. Providers also explained how they prioritized PIP during rounding by using a checklist and asking nurses about skin concerns.

Audits. With the advent of publicly reported quality data and emphasis on evidence-based practice, audits and feedback have become an encouraged and favored method to increase compliance. It would then not be surprising to find tasks that undergo regular auditing may be prioritized by ICU staff. Still, in spite of audits and penalties imposed on hospitals, a commonly reported missed care was providers not performing skin assessments but documenting that they

had. When asked about consequences for a HAPI, providers responded that they did not suffer any and that it was on nursing. Even when HAPIs led to investigations, providers still saw no consequences, but some empathized with nursing explaining that not all PIs were preventable.

Prevalence days were conducted at all hospitals during which all ICU patients were assessed for skin integrity. Although these were not audits of CCRNs, when care elements were visibly lacking, they were noticed. Two experienced CCRNs reported frustration with CCRNs for lack of attention to easily correctable details on their patients that greatly increased risk for tissue breakdown. Examples were leaving syringe caps and wires underneath immobile patients, omitting gastric tube care for several shifts, and not checking NG tubes and Foley catheters. The prevalence CCRNs explained that they did not initiate performance correcting conversations often anymore, because the nurses' responses would mostly be deflection of responsibility. At two hospitals, findings from the prevalence day were presented at prevalence meetings which served as education but also accountability for the unit.

There were different approaches once a HAPI occurred. One approach included the wound specialists leading the investigation by talking to nurses who cared for the patient over several days, if possible to the patient, and by doing a chart review to reach a finding of avoidable or not avoidable. Wound specialists reported to email results to the unit manager for follow-up with the staff. At one hospital, CCRNs reported that the manager got upset when HAPIs developed. Other CCRNs reported that nurses may not call a PI a PI to avoid the paperwork and having to investigate who was at fault for the injury. At the same hospital, nurses who were identified as being involved in the injury, were "dinged" in their personnel file showing they received counseling (RC2).

Some CCRNs reported that the ICU manager attended the multidisciplinary morning rounds and asked about each patient's plan of care which included skin health. Although the presence of a leader at the rounds communicated high priority of PIP to the staff, CCRNs could easily circumvent that expectation when they did not have time to do skin assessments by simply repeating what the outgoing shift had told them.

Discussion

After decades of clinical and interventional studies and disseminating clinical guidelines on how to prevent PIs, HAPIs are still increasing while other hospital acquired conditions have been decreasing.[6] This study investigated how the human factor impacts prevention. CCRNs and ICU providers offered multiple and rich descriptions of the challenges to integrate PIP in their daily practice. Figure 1 depicts the process of how stakeholders engage or disengage with PIP numerous times a day by interpreting transition points they encounter based on their preconceptions and misconceptions and how they consequently set priorities. Most participants assigned a high priority to PIP, but there were challenges in integrating it in an environment with many other high priorities. This study identified several potential mediators that could contribute to CCRNs and providers underprioritizing PIP.

Most Critical Patients Can Undergo PIP

A major general misconception held by both CCRNs and providers was that the highly critical and hemodynamically unstable patients could not tolerate PIP activities which most understood as side-to-side turns only. Other studies have also found that patient acuity and hemodynamic instability are often cited as a reason to not engage in PIP although data indicate that benefits of repositioning outweigh the perceived risks.[57,58]

The verbal or written orders to not move patients were for 24 hours to several days. Bedrest is harmful for even healthy individuals, but it is highly detrimental to hospitalized patients, especially so in the ICU.[59-62] Hemodynamic instability guidelines suggest to reposition all critical patients and provides clinical findings that might prevent turning at two-hour intervals.[57,90] None include that patients on vasopressors should be excluded from PIP as was suggested by participants. In fact, clinicians are to take advantage of vasopressors to titrate blood pressure during PIP activities while participants saw the use of multiple vasopressors to be prohibitive to PIP. Even for patients deemed too unstable to turn, recommendations are to trial turn at least every eight hours to assess tolerance for returning to two-hour schedules. In the meantime, guidelines state to engage in alternative PIP activities, such as micro-turns, weight shifting every 30 minutes, elevating heels, repositioning head, arms, legs at least every hour, passive range of motion, and continuous lateral rotation therapy (CLRT). All activities are to be done slowly.[57] Some CCRNs and providers had wished for the CLRT beds thinking that it replaced the need for manual repositioning which is a common misconception. Indeed, technology is a supplement to PIP rather than a replacement. CLRT, for instance, has been shown to increase shear injuries in morbidly obese populations.[63] Several CCRN and physician participants asserted that they did not support repositioning patients with ARDS fearing to decompensate their respiratory status further. Yet, evidence suggests that modified PIP activities benefit this patient population.[87, 88]

The quandary with critical patients' hemodynamic status is that if they are not repositioned and turned within the early days of admission, they develop gravitational equilibrium, which is what providers and CCRNs report as a rationale for not turning. So, their worsened state may actually develop because they were not turned. Gravitational equilibrium is

when a patient becomes hemodynamically calibrated to a supine position. This orthostatic response is intensified under certain conditions, such as when patients are elderly, hypovolemic, and febrile.[64,65]

PIP is More Than Turning

A misconception that contributed to thinking that the above patients cannot undergo repositioning is that both CCRN and provider stakeholders, but more so the providers, thought PIP to include only side-to-side turning of 90 degrees. Such turns can actually exert more pressure on bony prominences and may be too extreme for hemodynamically challenging patients, especially if done too quickly.[57] PIP is multidimensional and goes beyond turning. Nutrition, prealbumin, albumin, micro-turns, weight shifting, offloading, moisture control, support surfaces and dressings, subepidermal moisture scanners, pressure mats, reduction and oversight of invasive devices, and education are just some of the relevant interventions.[66-69]

Physician providers had misperceptions regarding the frequency of repositioning patients as well. They thought it to be a minimum of three to 12 hours and as such sometimes ordered not to move patients for up to 72 hours or even longer. Both CCRNs and providers had misperceptions about how long it takes for PIs to develop with estimates as high as several days. Similar previous findings indicated that 87% of physicians thought it would take at-risk patients four to 48 hours to develop PIs.[28] In fact, integrated reviews from human, animal, and in vitro studies show tissue injury occurs between the first hour and four hours after sustained loading.[70] Blood flow to heel tissues in higher risk patients decreases within 30 minutes of surface contact and does not return to baseline after two hours offloading. In other PI prone anatomic areas, blood flow decreases significantly after two hours of loading and does not return to baseline even

after two hours offloading.[71,72] Such findings indicate that repositioning at two-hour intervals should be considered a maximum interval.

Unfortunately, these findings echo what has been found in other studies on adherence to clinical guidelines. One prospective observational study found that only three percent of patients were repositioned at two-hour intervals.[86] Another study found that the median time was four hours across 48 ICUs.[73] Pickham and colleagues (2018)[74] found a 54% compliance with frequency while only 39% of these met the minimum threshold for a quality turn. Patients remained supine for 72% of the time. They also learned there was a bias in turning practices such that being a male patient, having a high body mass index, and a low Braden score was associated with significantly with lower compliance. This might be because most of the nursing workforce are females.[75] Especially in hospitals without a lift team, one explanation might be the difficulty nurses have in manually turning these patients. Even when lift teams are present, they round at two-hour intervals at most and are not present for ad hoc needed repositioning which participants reported.

Consequently, if most CCRNs and providers have misconceptions and knowledge deficits regarding these crucial details, misconceptions become accepted norms of the unit. These attitudes might be even favored, because they decrease a time-intensive and repetitious task from the daily workflow for up to several days. Most providers and CCRNs did however assign high priority to PIP and some did insist that clinicians could perform PIP for even the very critical patients. Because they were the minority however, their attitudes could not become the norm. In fact, when they expressed such views in focus groups, other participants did not agree.

Consequences Differ Between CCRNs and Providers Once HAPIs Occur

The vast majority of research on PIs has been conducted by the nursing profession. Most CCRNs and providers opined that PIP was a nursing responsibility although many also said that multiple disciplines were responsible for prevention, such as physicians, respiratory therapists, dietitians, etc. The data clearly indicated that once a HAPI occurred, even when leaders insisted that they did not have a culture of blame, investigations looked for visible omissions of care within the nursing service. If someone was reprimanded, it was the nursing service and this was especially true in two hospitals. For example, one manager wrote up all nurses who provided care for a patient who developed a PI. Providers, on the other hand, although it was commonly known that they documented skin assessments they had not done, reported that they never saw consequences for HAPIs. These findings indicate that there are deeply ingrained attitudes on division of responsibility regarding PIP at all levels of the organization. In spite of calls for multidisciplinary efforts to prevent PIs in the ICU along with non-payments to hospitals for severe ulcers, attitudes have not shifted yet. Indeed, most providers reported that they did not see themselves having a role, and certainly not an active role, in prevention and even preferred to be removed from it further. This stands in contrast to previous findings indicating that ICU physicians deemed themselves to have an important role in PIP and even thought that physicians should be engaged in prevention research.[29]

Roots and Implications of Differences

There is a process of acculturation at play which all nurses and providers have been conforming to and which starts early in their training. All providers, except the NP, reported that they had no or minimal training in and exposure to PIP in their professional schools or after. Indeed, studies indicate that medical schools either do not include PIs at all in their curriculum or they spend half an hour in the first year, 20 minutes in the second year and none in the remaining

years on physiology of tissue injury. No time is spent on learning about preventing the costliest avoidable hospital acquired condition .[76,77] On the other hand, all nurses' education on PIP starts in the first days of nursing school with stories of Nightingale proclaiming it a nursing responsibility.[78] Interestingly however, CCRNs blamed nursing schools for a change in nursing culture, because CCRNs now lack foundational training, including PIP, and employers and colleagues need to fill that gap. Studies indicate that although nursing school curricula covered PIs and their prevention, important deficiencies were evident such as teaching risk assessments with validated tools and prevention protocols.[79] Although regulations and financial penalties, such as those imposed by insurance carriers, are an important step in creating motivation, a more effective intervention would be to encourage attitudes and knowledge constructive to PIP. Institutionalizing evidence-based PIP programs in both nursing and medical schools such that they are incorporated in the departments' cultures without being questioned or circumvented may improve both performance and engagement of PIP in the ICU.

In light of this study's findings, we need to ask whether provider involvement in PIP is truly a desired and required component to improving PIP programs and the increasing ICU PI incidence rates across the world. In spite of calls for multidisciplinary collaboration, providers remain resistant, because they have tended to be passive participants whose involvement thus far has been cosigning treatment orders by wound care nurses. Considering the regulations that regard severe PIs as never-events or medical errors did not originate from within the provider professions, it is not surprising that buy-in has been slow at best. Additionally, physicians, including participants in this study, have been expressing frustration with calling severe PIs never events and medical errors.[80,81] They opined that getting medical care is always high risk and that some simply fall on the wrong side of that risk. Even with the best of care, providers

thought, some PIs were not preventable. Still, one physician admitted that this strong terminology has received attention and increased efforts to reduce PIs and might be of benefit. The frustration could be misplaced however, because hospitals can make their case to their oversight agency when a HAPI was indeed unavoidable. It is time intensive to do such investigations, but considering the high human and financial costs that severe PIs inflict, the investment is justified.

Most CCRNs continue to see themselves as ultimately responsible for this area of care although they would appreciate increased awareness from providers. Although providers empathizing with CCRNs is beneficial to building positive relationships, what is more pertinent is their realization that they play an integral and active role in PIP. Some examples are that nutritional deficits are common and especially so in ICU patients. Protein supplementation with ongoing orders of albumin and prealbumin starting with admission are necessary.[82-84] Especially in hospitals where nurses still have to go through providers to obtain costly support surfaces, providers have to familiarize themselves with the criteria for use and have to be mindful of initiating these orders earlier and of responding to nurses quickly. Specialties whose patients are at even higher risk for PIs must be learned and engaged in prevention, because they are most familiar with their surgical procedures and invasive devices and how these could injure patient tissues.[85] Nurses receive a general education and will often only after years of experience working with a specific patient population learn some of these intricacies. Finally, an important reason for providers to become more engaged in PIP is based the findings of patient and family participants which are reported elsewhere in detail.[26] These indicate that although patients and families respect CCRNs, they are more compliant if their ICU provider educates them on PIP or imparts its importance on them.

It is evident that only with the consistent and collegial collaboration between these two health professions, CCRNs and ICU providers, approaches to PIP management in the ICU can be improved to a point where PI incidence rates start decreasing and this vulnerable patient population can count itself safer from unnecessary suffering inflicted by PIs.

Limitations and Strengths

Although the design of this study limits generalizations, it is a necessary approach to better understand the attitudes of crucial stakeholders in the ICU. It is a foundation for further research to learn how human factors contribute to the development of preventable PIs.

While every effort was made to recruit CCRNs who were representative of this discipline, access to them within hospitals was guided by the ICU administration which may have diminished the heterogeneity of this stakeholder group.

Despite these limitations, this study has some important strengths. To our knowledge, this is the first published study to include the voice of major stakeholders about attitudes regarding PIP in the ICU. It was also exclusively conducted in the United States while the majority of the studies on ICU attitudes, of which there were few, were conducted internationally. It is also the first to exclusively focus on ICU stakeholders to elucidate the unique struggles of this highly dynamic and acute population. An attempt was made to learn the views of a wide range of CCRNs and providers by recruiting from four different hospitals and six different ICUs. To build rapport and increase trust, participants were given the choice to review their taped interviews and to request deletion of portions or all content. This motivated participants to speak freely. In fact, several participants expressed gratefulness and reported a therapeutic effect after concluding the interviews.

Conclusion

The findings of this study revealed how CCRNs and ICU providers struggle to make PIP a priority in their workflow. It highlighted the challenges of integrating a process that does not have immediately visible results in an environment that is dynamic, fast-paced, and burdened with continuous competing demands. The preconceptions, specifically misconceptions, held by CCRNs and providers has an important role in how they interpret any transition points and how they prioritize their tasks. Although both CCRN and provider stakeholders had several preconceptions that could be used as anchors to implementing effective PIP programs, such as performing PIP with even the most critical patients, these were held by the minority of participants. Most preconceptions reported were misconceptions that could be detrimental to the course of treatment of ICU patients, like believing that highly critical patients could not undergo PIP activities.

TABLE 2. Characteristics of Critical Care Nurse and ICU Provider Participants

	All Participants	Academic CCRN	Community CCRN	Academic Provider	Community Provider
Mean ± Standard Deviation or n(%)					
	n=41	n=12	n=14	n=11	n=4
Age (years)	42±13	36±17	43±13	43±8	50±11
Range	23-65	23-63	24-65	32-56	36-59
p value (age)		0.25		0.18	
Gender: % female	71	83	100	45	0
Ethnicity/Race :					
Black	2(5)	1(8)	0	0	0
Asian	17(41)	3(25)	8(57)	3(27)	3(75)
White	21(51)	8(67)	5(36)	4(36)	4(100)
Hispanic	1(2)	0	1(7)	1(9)	0
Native American	0	0	0	0	0
Education:					
Associate/Diploma	7(27)	2(16)	5(36)		

Bachelor's Degree	15(58)	9(75)	6(43)		
Master's Degree	4(15)	1(8)	3(21)		
Nurse Practitioner				1(8)	
Medical Doctor				10(82)	4(100)
Experience ICU **Range (years)**	12±12 1-44	12±15 1-35	14±12 1.5-42	9±9 1-27	11±7 20-44

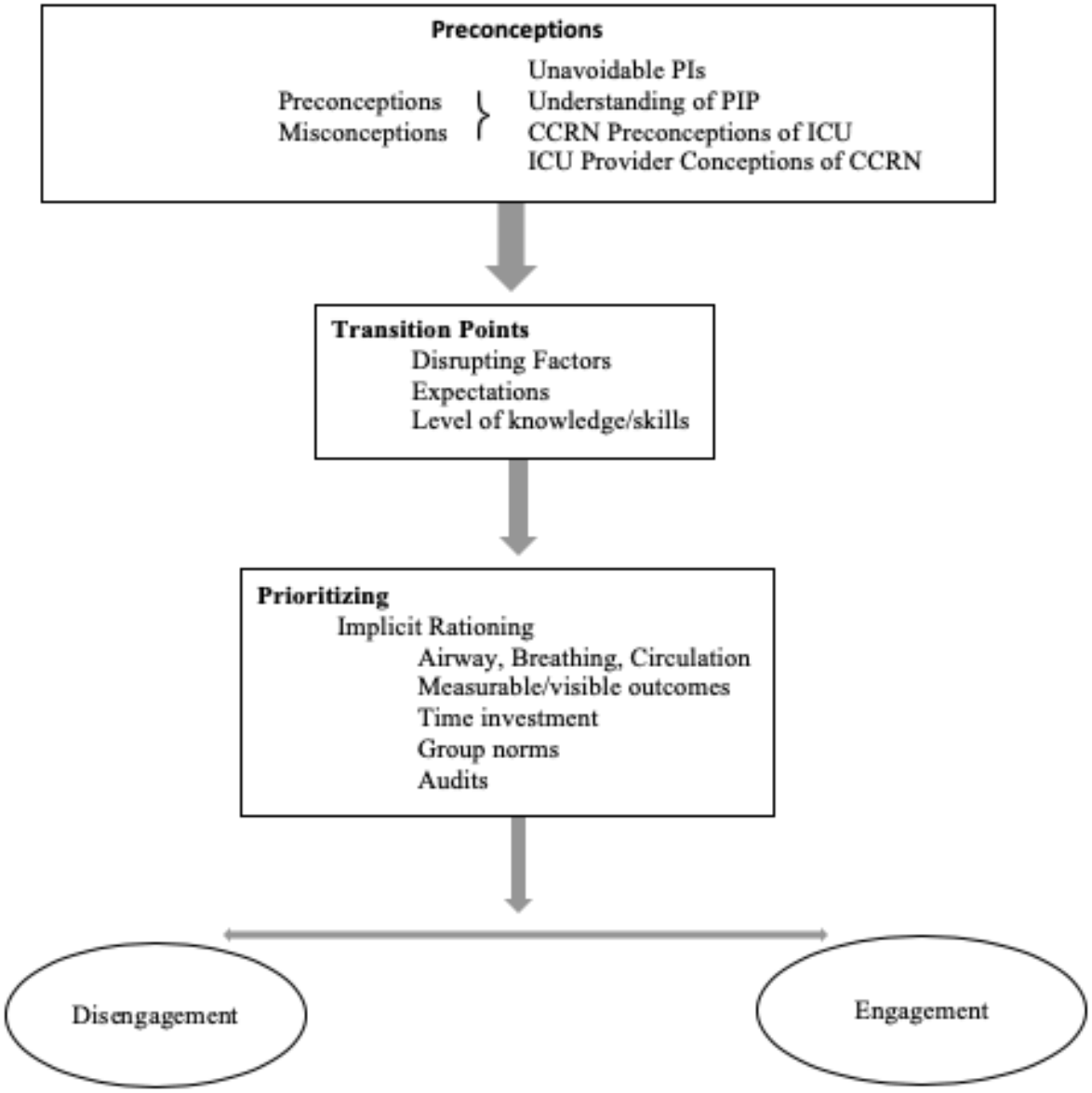

Figure 1. Explanation of Critical Care Nurses and Providers Engaging and Disengaging with Pressure Injury Prevention

References

1 Guest, J. F., Ayoub, N., McIlwraith, T., Uchegbu, I., Gerrish, A., Weidlich, D., … Vowden, P. (2015a).Health economic burden that wounds impose on the National Health Service in the UK. *British Medical Journal Open*, 5, e009283.

2 Guest, J. F., Ayoub, N., McIlwraith, T., Uchegbu, I., Gerrish, A., Weidlich,D., … & Vowden, P. (2017).Health economic burden that different wound types impose on the UK's National Health Service. *International Wound Journal, 14*, 322– 330. https://doi.org/10.1111/iwj.12603

3 Theisen, S., Drabik, A., & Stock, S. (2012). Pressure ulcers in older hospitalised patients and its impact on length of stay: a retrospective observational study. *Journal of clinical nursing*, *21*(3-4), 380-387.

4 Dealey, C., Posnett, J., & Walker, A. (2012). The cost of pressure ulcers in the United Kingdom. *Journal of Wound Care*, *21*(6), 261– 266.

5 Gorecki, C., Brown, J. M., Nelson, E. A., Briggs, M., Schoonhoven, L., Dealey, C., ... & Nixon, J. (2009). Impact of pressure ulcers on quality of life in older patients: a systematic review. *Journal of the American Geriatrics Society*, 57(7), 1175-1183.

6 AHRQ National Scorecard on Hospital-Acquired Conditions. Content last reviewed January 2019. Agency for Healthcare Research and Quality, Rockville, MD. http://www.ahrq.gov/professionals/quality-patient-safety/pfp/index.html

7 Squitieri, L., Waxman, D. A., Mangione, C. M., Saliba, D., Ko, C. Y., Needleman, J., & Ganz, D. A. (2018). Evaluation of the Present-on-Admission Indicator among Hospitalized Fee for-Service Medicare Patients with a Pressure Ulcer Diagnosis: Coding Patterns and

Impact on Hospital-Acquired Pressure Ulcer Rates. *Health Services Research*, *53*, 2970-2987.

8 Shreve, J., Van Den Bos, J., Gray, T., Halford, M., Rustagi, K., & Ziemkiewicz, E. (2010). The economic measurement of medical errors sponsored by society of actuaries' health section. Milliman Inc.

9 Benoit, Jr., R. A., & Watts, C. (2007). The effect of a pressure ulcer prevention program and the bowel management system in reducing pressure ulcer prevalence in an ICU setting. *Journal of Wound Ostomy & Continence Nursing*, *34*(2), 163-175.

10 Compton, F., Hoffmann, F., Hortig, T., Strauss, M., Frey, J., Zidek, W., & Schafer, J. H. (2008). Pressure ulcer predictors in ICU patients: nursing skin assessment versus objective parameters. *Journal of Wound Care, 17*(10).

11 Langemo, D. K., Anderson, J., & Volden, C. (2004). Uncovering Pressure Ulcer Incidence. *Holistic Nursing Practice, 18*(1), 42-44.

12 VanGilder, M., Amlung, S., Harrison, P., & Meyer, S. (2009). Results of the 2008–2009 International Pressure Ulcer Prevalence™ Survey and a 3-year, acute care, unit-specific analysis. *Ostomy Wound Management, 55*, 39-45.

13 Whittington, K. T., & Briones, R. (2004). National prevalence and incidence study: 6-year sequential acute care data. *Advances in Skin & Wound Care, 17*(9), 490-494.

14 Athlin, E., Idvall, E., Jernfält, M., & Johansson, I. (2009). Factors of importance to the development of pressure ulcers in the care trajectory: perceptions of hospital and community care nurses. *Journal of Clinical Nursing*, *19*(15-16), 2252-2258.

15 Langer, G., & Fink, A. (2014). Nutritional interventions for preventing and treating pressure ulcers. Cochrane Database of Systematic Reviews 2014, Issue 6. Art. No.: CD003216. DOI:10.1002/14651858.CD003216.pub2.

16 McInnes, E., Jammali-Blasi, A., Bell-Syer, S., Dumville, J., & Cullum, N. (2012). Preventing pressure ulcers—are pressure-redistributing support surfaces effective? A Cochrane systematic review and meta-analysis. *International Journal of Nursing Studies*, *49*(3), 345-359.

17 Moore, Z., & Cowman, S. (2008). A systematic review of wound cleansing for pressure ulcers. *Journal of Clinical Nursing, 17*(15), 1963-1972.

18 Armstrong, D. G., Ayello, E. A., Capitulo, K. L., Fowler, E., Krasner, D. L., Levine, J. M.,…& Smith, A. P. (2008). New opportunities to improve pressure ulcer prevention and treatment: implications of the CMS inpatient hospital care present on admission indicators/hospital-acquired conditions policy: a consensus paper from the International Expert Wound Care Advisory Panel. *Advances in Skin & Wound Care*, *21*(10), 469-478.

19 Beeckman, D., Defloor, T., Schoonhoven, L., & Vanderwee, K. (2011). Knowledge and attitudes of nurses on pressure ulcer prevention: a cross-sectional multicenter study in Belgian hospitals. *Worldviews on Evidence-Based Nursing*, *8*(3), 166 176.

20 Dunleavy, K. (2008). Putting a dent in pressure ulcer rates. *Nursing 2008*, 38(1), 20-21.

21 Young, J., Ernsting, M., Kehoe, A., & Holmes, K. (2010). Results of a clinician-led evidence-based task force initiative relating to pressure ulcer risk assessment and prevention. *Journal of Wound Ostomy & Continence Nursing*, *37*(5), 495-503.

22 Bernard, M. (2002). Values as truisms: extensions and social consequences. School of Psychology Cardiff, University of Wales, Cardiff.

23 Pakizeh, A. (2005). Basic human values: implicit structure, dynamic properties and attitudinal consequences (Doctoral dissertation, Cardiff University).

24 Kingston, M. J., Evans, S. M., Smith, B. J., & Berry, J. G. (2004). Attitudes of doctors and nurses towards incident reporting: a qualitative analysis. *Medical Journal of Australia, 181*(1), 36-39.

25 Kossover-Smith, R. A., Coutts, K., Hatfield, K. M., Cochran, R., Akselrod, H., Schaefer, M. K., ... & Bruss, K. (2017). One needle, one syringe, only one time? A survey of physician and nurse knowledge, attitudes, and practices around injection safety. *American Journal of Infection Control, 45*(9), 1018-1023.

26 Rahimi, Y.; Bates-Jensen, B.M.; Pavlish, C.; Hodge, F. & Benharash, P. (2019). Major Stakeholders' Attitudes Regarding Pressure Injury Prevention in Intensive Care Units – A Literature Review. Unpublished manuscript.

27 Odierna, E., & Zeleznik, J. (2003). Pressure ulcer education: a pilot study of the knowledge and clinical confidence of geriatric fellows. *Advances in Skin & Wound Care*, *16*(1), 26-30.

28 Suen, W., Parker, V. A., Harney, L., Nevin, S., Jansen, J., Alexander, L., & Berlowitz, D. (2012). Internal medicine interns' and residents' pressure ulcer prevention and assessment attitudes and abilities: results of an exploratory study. *Ostomy Wound Manage*, *58*(4), 28-35.

29 Cox, J., Roche, S., & Gandhi, N. (2013). Critical care physicians: attitudes, beliefs, and knowledge about pressure ulcers. *Advances in Skin & Wound Care*, *26*(4), 168-176.

30 Cabana, M. D., Rand, C. S., Powe, N. R., Wu, A. W., Wilson, M. H., Abboud, P. A. C., & Rubin, H. R. (1999). Why don't physicians follow clinical practice guidelines?: A

framework for improvement. *Journal of the American Medical Association*, *282*(15), 1458-1465.

31 Bikker, A. P., Atherton, H., Brant, H., Porqueddu, T., Campbell, J. L., Gibson, A., ... & Ziebland, S. (2017). Conducting a team-based multi-sited focused ethnography in primary care. *BMC Medical Research Methodology*, *17*(1), 139.

32 Charmaz, K. (2006). *Constructing grounded theory: A practical guide through qualitative analysis*. Thousand Oaks, CA: Sage.

33 Knoblauch, H. (2005). Focused Ethnography. In *Forum Qualitative Sozialforschung/Forum: Qualitative Social Research* , 6*(3).*

34 Streubert, H.J. (2011). Ethnography as method. In H.J. Streubert & D.R. Carpenter (Eds.), *Qualitative research in nursing: Advancing the humanistic imperative.* (5th ed., pp. 167–196). Philadelphia, PA: Lippincott Williams and Wilkins.

35 Speziale, H. (2007). Ethnography as Method. In H. Speziale & D. Carpenter (Eds.), *Qualitative Research in Nursing: Advancing the Humanistic Imperative* (pp. 195–226). Philadelphia, PA: Lippincott Williams and Wilkins.

36 Beeckman, D., Defloor, T., Demarré, L., Van Hecke, A., & Vanderwee, K. (2010). Pressure ulcers: Development and psychometric evaluation of the Attitude towards Pressure ulcer Prevention Instrument (APuP). *International Journal of Nursing Studies*, *47*(11), 1432-1441.

37 Kalisch, B. J., Landstrom, G., & Williams, R. A. (2009). Missed nursing care: errors of omission. *Nursing Outlook*, *57*(1), 3-9.

38 Moore, Z., & Price, P. (2004). Nurses' attitudes, behaviours and perceived barriers towards pressure ulcer prevention. *Journal of Clinical Nursing*, *13*(8), 942-951.

39 Athlin, E., Idvall, E., Jernfält, M., & Johansson, I. (2009). Factors of importance to the development of pressure ulcers in the care trajectory: perceptions of hospital and community care nurses. *Journal of Clinical Nursing*, *19*(15-16), 2252-2258.

40 Barakat-Johnson, M., Barnett, C., Wand, T., & White, K. (2018). Knowledge and Attitudes of Nurses Toward Pressure Injury Prevention. *Journal of Wound, Ostomy and Continence Nursing, 45*(3), 233-237.

41 Beeckman, D., Defloor, T., Demarré, L., Van Hecke, A., & Vanderwee, K. (2010). Pressure ulcers: Development and psychometric evaluation of the Attitude towards Pressure ulcer Prevention Instrument (APuP). *International Journal of Nursing Studies*, *47*(11), 1432-1441.

42 Beeckman, D., Defloor, T., Schoonhoven, L., & Vanderwee, K. (2011). Knowledge and attitudes of nurses on pressure ulcer prevention: a cross-sectional multicenter study in Belgian hospitals. *Worldviews on Evidence-Based Nursing*, 8(3), 166 176.

43 Florin, J., Bååth, C., Gunningberg, L., & Mårtensson, G. (2016). Attitudes towards pressure ulcer prevention: a psychometric evaluation of the Swedish version of the APuP instrument. *International Wound Journal*, *13*(5), 655-662.

44 Kalisch, B. J. (2006). Missed nursing care: a qualitative study. *Journal of Nursing Care Quality*, *21*(4), 306-313.

45 Kalisch, B. J., Landstrom, G., & Williams, R. A. (2009). Missed nursing care: errors of omission. *Nursing Outlook*, *57*(1), 3-9.

46 Kalisch, B. J., Tschannen, D., Lee, H., & Friese, C. R. (2011). Hospital variation in missed nursing care. *American Journal of Medical Quality*, *26*(4), 291-299.

47 Källman U., Suserud, B-O. (2009). Knowledge, attitudes and practice among nursing staff concerning pressure ulcer prevention and treatment-a survey in a Swedish healthcare setting. *Scandinavian Journal of Caring Sciences*, *23*(2):334-41.

48 Moore, Z., & Price, P. (2004). Nurses' attitudes, behaviours and perceived barriers towards pressure ulcer prevention. *Journal of Clinical Nursing*, *13*(8), 942-951.

49 Samuriwo, R. (2010). The impact of nurses' values on the prevention of pressure ulcers. *British Journal of Nursing*, *19*(15), S4-S14.

50 Sving, E., Gunningberg, L., Högman, M., & Mamhidir, A. G. (2012). Registered nurses' attention to and perceptions of pressure ulcer prevention in hospital settings. *Journal of Clinical Nursing*, *21*(9-10), 1293-1303.

51 Strand, T., & Lindgren, M. (2010). Knowledge, attitudes and barriers towards prevention of pressure ulcers in intensive care units: a descriptive cross-sectional study. *Intensive and Critical Care Nursing*, *26*(6), 335-342.

52 Tallier, P. C., Reineke, P. R., Asadoorian, K., Choonoo, J. G., Campo, M., & Malmgreen-Wallen, C. (2017). Perioperative registered nurses' knowledge, attitudes, behaviors, and barriers regarding pressure ulcer prevention in perioperative patients. *Applied Nursing Research, 36*, 106-110.

53 Cox, J., Roche, S., & Gandhi, N. (2013). Critical care physicians: attitudes, beliefs, and knowledge about pressure ulcers. *Advances in Skin & Wound Care*, *26*(4), 168-176.

54 Suen, W., Parker, V. A., Harney, L., Nevin, S., Jansen, J., Alexander, L., & Berlowitz, D. (2012). Internal medicine interns' and residents' pressure ulcer prevention and assessment attitudes and abilities: results of an exploratory study. *Ostomy Wound Manage*, *58*(4), 28-35.

55 Muhr, F. (2019). ATLAS.ti 8.4.4 (1135) [Version 8:]. Scientific Software Development GMBH. [Software]. Berlin, Germany. Available from http://atlasti.com/home/

56 Clement, J., Brown, D. E., & Zietsman, A. (1989). Not all preconceptions are misconceptions: finding 'anchoring conceptions' for grounding instruction on students' intuitions. *International Journal of Science Education*, *11*(5), 554-565.

57 Brindle, C. T., Malhotra, R., O'Rourke, S., Currie, L., Chadwik, D., Falls, P., ... & Creehan, S. (2013). Turning and repositioning the critically ill patient with hemodynamic instability: A literature review and consensus recommendations. *Journal of Wound Ostomy & Continence Nursing*, *40*(3), 254-267.

58 Morris PE, Goad A, Thompson C, et al. Early intensive care unit mobility therapy in the treatment of acute respiratory failure. *Critical Care Medicine, 36*(8), 2238–2243.

59 Brower R. Consequences of bed rest. *Critical Care Medicine, 37*(10) (Suppl.), 422-S428.

60 Lingren M, Unosson M, Fredrikson M, Ek AC. Immobility—a major risk factor for development of pressure ulcers among adult hospitalized patients: a prospective study. *Scandinavian Journal of Caring Science, 18,* 57-64.

61 Vollman K. (2010). Introduction to progressive mobility. *Critical Care Nurse, 30*(2), S3-S5.

62 Winkelman C. Bed rest in health and critical illness: a body systems approach. *AACN Advance Critical Care. 20*(3), 254-266.

63 Turpin P., Pemberton V. Prevention of pressure ulcers in patients being managed on CLRT: is supplemental repositioning needed? *Journal Wound Ostomy Continence Nursing, 33*(4), 381-388.

64 Choi J., Tasota F.J., Hoffman, L.A. Mobility interventions to improve outcomes in patients undergoing prolonged mechanical ventilation: a review of literature. *Biological Research for Nursing, 10*(1),21-33.

65 Winslow, E.H., Clark, A.P., White, K.M., Tyler, D.O. Effects of a lateral turn on mixed venous oxygen saturation and heart rate in critically ill adults. *Heart Lung, 9,* 557-561.

66 National Pressure Ulcer Advisory Panel, European Pressure Ulcer Advisory Panel and Pan Pacific Pressure Injury Alliance. (2014). *Prevention and Treatment of Pressure Ulcers: Clinical Practice Guideline. Emily Haesler (Ed.).* Cambridge Media: Osborne Park, Western Australia.

67 Registered Nurses Association of Ontario. (2005). Risk assessment and prevention of pressure ulcers: Toronto. http://www.guideline.gov/summary/summary.aspx?doc_id=7006#s24

68 Veterans Health Administration. VHA Handbook 1180.02 Prevention of Pressure Ulcers. http://www1/va/gpv/vhapublications/ViewPublication. asp?pub_ID=2422. Published July 1, 2011

69 Wound, Ostomy and Continence Nurses Society. (2003). Guidelines for the prevention and management of pressure ulcers. *Wound, Ostomy and Continence Nurses Society:* Illinois.

70 Gefen, A. (2008). How much time does it take to get a pressure ulcer? Integrated evidence from human, animal, and in vitro studies. *Ostomy Wound Manage*, *54*(10), 26-35.

71 Liu, L. Q., Deegan, R., & Gall, A. (2015). Non-invasive technologies of tissue viability measurement for pressure ulcer prevention in spinal cord injury. *HSOA Journal of Physical Medicine, Rehabilitation & Disabilities*, *1*(1).

72 Wong, V. (2011). Skin blood flow response to 2-hour repositioning in long-term care residents: a pilot study. *Journal of Wound Ostomy & Continence Nursing*, *38*(5), 529-537.

73 Goldhill DR, Imhoff M, McLean B, Waldmann C. Rotational bed therapy to prevent and treat respiratory complications: a review and meta-analysis. *American Journal of Critical Care. 16*(1), 50-61.

74 Pickham, D., Pihulic, M., Valdez, A., Mayer, B., Duhon, P., & Larson, B. (2018). Pressure Injury Prevention Practices in the Intensive Care Unit: Real-world Data Captured by a Wearable Patient Sensor. *Wounds: a compendium of clinical research and practice*, *30*(8), 229-234.

75 Landivar, L.C. (2013). Men in nursing occupations: *American community survey highlight report.* Suitland: U.S. Bureau of the Census, Social, Economic, and Housing Statistics Division.

76 Patel, N. P., & Granick, M. S. (2007). Wound education: American medical students are inadequately trained in wound care. *Annals of plastic surgery*, *59*(1), 53-55.

77 Yim, E., Sinha, V., Diaz, S.I., Kirsner, R.S., Salgado, C.J. (2014). Wound healing in US medical school curricula. *Wound Repair Regeneration, 22*(4),467-472.

78 Nightingale, F. (1992). *Notes on nursing: What it is, and what it is not*. Lippincott Williams & Wilkins.

79 Ayello, E. A., & Meaney, G. (2003). Replicating a survey of pressure ulcer content in nursing textbooks. *Journal of Wound, Ostomy and Continence Nursing*, *30*(5), 266-271.

80 Deibert, C. M., Kates, M., McKiernan, J. M., & Spencer, B. A. (2015). National estimated costs of never events following radical prostatectomy. *Urologic Oncology: seminars and original investigations, 33*(9), 385.

81 The Leapfrog Group: Never Events Management. Available at https://www.leapfroggroup.org/ratings-reports/never-events-management. Accessed August 13, 2019.

82 Hammad, A., Kaido, T., Aliyev, V., Mandato, C., & Uemoto, S. (2017). Nutritional therapy in liver transplantation. *Nutrients*, *9*(10), 1126.

83 Posthauer, M. E., Banks, M., Dorner, B., & Schols, J. M. (2015). The role of nutrition for pressure ulcer management: national pressure ulcer advisory panel, European pressure ulcer advisory panel, and pan pacific pressure injury alliance white paper. *Advances in skin & wound care*, *28*(4), 175-188.

84 Shenkin, A. (2006). Serum prealbumin: is it a marker of nutritional status or of risk of malnutrition? *Clinical Chemistry, 52,* 2177-2179.

85 Firouzbakht, P. K., Israel, J. S., Chen, J. T., & Rao, V. K. (2018). Medicare for the Plastic and Reconstructive Surgeon. *Plastic and reconstructive surgery*, *142*(2), 568-576.

86 Krishnagopalan, S., Johnson, E. W., Low, L. L., & Kaufman, L. J. (2002). Body positioning of intensive care patients: clinical practice versus standards. *Critical Care Medicine, 30*(11), 2588-2592.

87 Bein, T., Reber, A., Metz, C., Jauch, K. W., & Hedenstierna, G. (1998). Acute effects of continuous rotational therapy on ventilation-perfusion inequality in lung injury. *Intensive Care Medicine*, *24*(2), 132-137.

88 Robak, O., Schellongowski, P., Bojic, A., Laczika, K., Locker, G. J., & Staudinger, T. (2011). Short-term effects of combining upright and prone positions in patients with ARDS: a prospective randomized study. *Critical Care*, *15*(5), R230.

89 Van Den Bos, J., Rustagi, K., Gray, T., Halford, M., Ziemkiewicz, E., & Shreve, J. (2011). The $17.1 billion problem: the annual cost of measurable medical errors. *Health Affairs*, *30*(4), 596-603.

90 NPUAP/EPUAP. (2019). National Pressure Ulcer Advisory Panel, European Pressure Ulcer Advisory Panel and Pan Pacific Pressure Injury Alliance. (3rd ed.).

Ethnography of Patients' and Families' Attitudes Toward Pressure Injury Prevention in Intensive Care Units

Objective: To elucidate the attitudes of patients and families towards pressure injury prevention (PIP) in ICUs.

Background: Pressure injuries (PIs) are debilitating and chronic wounds which carry a high human and financial cost. Patients in the intensive care unit (ICU) make up a vulnerable population that suffers disproportionately from these wounds in spite of widely disseminated clinical guidelines. Learning about attitudes of major stakeholders in the ICU, including patients and families, can elucidate reasons behind PI rates remaining high.

Methods: A total of thirteen patient and family interviews were held at four hospitals in Southern California. Focused ethnographic research method was applied to reveal implicit and explicit beliefs, practices, and interactions about PIP. Using Atlas.ti version 8.4.4 (1135), an iterative process of coding, sorting, categorizing, and constant comparison were used to reveal categories.

Findings: ICU patients and families demonstrated incomplete and inaccurate preconceptions of PIs and PIP. Participants reported minimal engagement by ICU staff in PIP during their stay. All participants were open to being active participants in PIP.

Discussion: Critical care nurses and ICU physicians previously reported that patients and families can be barriers to PIP. This study's findings however indicate that this stakeholder group lacks the necessary knowledge and understanding of the phenomenon to make informed decisions. Also, the overwhelming willingness to partake in PIP activities contrast ICU staff's accounts of this stakeholder group.

Conclusion: Further research is needed to explore the attitudes of ICU patients and families towards PIP and other patient safety factors in this setting. Triangulation of stakeholder group accounts are a necessary component of furthering understanding of PIP in ICUs.

Introduction

Pressure injury prevention (PIP) is an important patient safety and quality indicator for acute care hospitals.[4,5] In intensive care units (ICUs), PIP is more challenging because health care staff have to maneuver competing priorities, patients are in critical health states, and patients and families are in states of crises. Incidence rates for hospital acquired pressure injuries (HAPI) in ICUs are the highest among inpatients ranging from 14 percent to 43 percent.[3-7] The majority of HAPIs are deemed preventable and are therefore recognized as the costliest medical error.[8,53]

Research has primarily been conducted with and by nurses exploring risk assessment, equipment, reduction of friction and shear, nutrition, and education. Evidence-based clinical guidelines have been disseminated and implemented widely in ICUs.[9-16] While other hospital acquired conditions, such as ventilator associated pneumonias, have decreased in recent years, HAPI rates continue to increase.[17] It is the responsibility of researchers and health care organizations to investigate other potential predictors to avoidable HAPIs in ICUs. Human factors, such as attitudes and values have to be considered as predictors given that most HAPIs are avoidable. Indeed, studies have found that attitudes and values affect individuals' behaviors such that they have an observable behavioral pattern consistent with their values.[18-21]

Rahimi, Bates-Jensen, Pavlish, Hodge, and Benharash (2019)[22] conducted a review of literature on patients' and families' attitudes towards PIP in the ICU. In brief, their findings revealed that while no studies focused on the ICU population, four studies did explore patient perspectives. None were conducted in the United States. Findings indicated that patients valued PIP and also valued being engaged in prevention.[23-26] Disengagement and frustration with the health care team were apparent which affected patients physically and psychologically. Some examples that led to disengagement were nurses responding to patient concerns with delays and

physicians not managing PI-related pain adequately.[23-25] Patients felt motivated when they were actively involved in PIP activities. They especially looked forward to them because of the human connection with the staff and family that came with the PIP activities. Some patients reported they were disengaged because they had just undergone surgical procedures or felt too weak to be motivated. No studies were identified addressing family perspectives.[24]

This glaring gap in the literature makes evident the need for exploring human factors, such as attitudes, which inform behavioral patterns among patients and families. The objective of this study was to explore and reveal the attitudes of patients and families about PIP in ICUs. Findings of this study will inform future approaches to managing PIP in ICUs.

Methods

This study was part of a larger ethnographic study to examine attitudes towards PIP in ICUs among critical care nurses (CCRNs), providers, administrators/leaders, and patients and families. Only findings related to patients and families are reported in this paper. Only findings related to patients and families are reported in this paper. The Office of the Human Research Protection Program at the University of California, Los Angeles approved the study. The investigators obtained informed consent to participate in the study directly from participants prior to conducting interviews.

Framework

Focused ethnography, using analytic techniques of grounded theory, guided this study. Concerned with beliefs, practices, and interactions about a specific phenomenon in everyday life, everyday life, a process-focused research question, presented by the literature, is targeted.[31] Data collection focuses on specific target participants and situations to provide for context. Given the intensity of data collection over a limited time via short-term field visits, investigators must be

familiar with the milieu. [31] Investigators often move across different settings for data collection to gain more insights of processes around the phenomenon of interest.[29-31] Grounded theory analytic methods offer a conceptual rendering of the beliefs, practices, and interactions by approaching data collection and analysis systematically.[31] Rather than relying solely on field notes, audio-visual recordings are used. As such, multiple researchers can be exposed to the data in their original and unaltered ways eliciting analysis from independent reviewers and therefore decreasing researcher bias.[31] Investigators also explore literature about the phenomenon alongside data collection as a form of data to support emerging explanations.[30]

Setting and Sample

A CCRN and a nurse academic and clinical researcher were the investigators. The research team also included one research assistant. Four hospitals, two community-based organizations and two academic organizations, provided the setting for the study. The process of gaining access to the organizations was previously reported.[27] Flyers were left in ICU waiting rooms, staff lounges, and with ICU or hospital administration. Interested participants contacted the principal investigator via phone or email, were screened for eligibility, and were scheduled for interviews. Patients and families were eligible if they were 21 years or older, if the potential participant was either a patient or a family of a patient who was currently admitted to the ICU or had been an ICU patient within three years prior to the eligibility screening. Families had to have spent two hours or more at the ICU bedside.

Data Collection

The investigators were a CCRN and an expert in pressure injuries and hence were familiar with the milieu. As such, they did not have to be immersed in the field for extended periods to become familiarized. [29-31] Depending on participant preferences, meetings were

conducted in person in private rooms or by phone and lasted 15 minutes to 63 minutes with an average of 40 minutes. Interviews were held in dyads of family and patient, only patient, or only family. All participants started reporting on their ICU experiences once they were consented but before the recordings had started. The majority also continued once they were informed and they agreed that interviews had officially been concluded and that the recording had been stopped. Four participants contacted the investigator a second time after the interview to share what they deemed pertinent parts of their ICU experiences. The investigator took handwritten fieldnotes in all instances, recorded reports when possible, and asked for the participants' explicit permission to treat their reports as data. The ethnographic research approach encourages multiple data collection methods even if they are unplanned, because fieldwork is dynamic.[28,30]

The investigators developed a semi-structured interview guide based on a comprehensive literature review.[32-34] The guides were informed by the research team members' clinical experience, and in consultation with qualitative research experts. The guide was dynamic, because it was informed by insights gained and questions raised with each participant encounter and the consequent analysis of the data. The interview guides were piloted in an interview with a family and patient dyad. Based on findings from the pilot interview and the pilot participants' feedback, the guide was refined. All interviews were directed and conversational such that participant responses guided the conversation and which questions would be posed next. A brief interview guide with sample questions (Table 1) provides insight into the data collection approach during interviews and focus groups.

Table 1. Brief ICU Patient and Family Interview Guide

Intensive Care Unit Patients	**Intensive Care Unit Families**
Describe your state of mind during your stay in the ICU. How was it at admission and how did it change over time?	Describe your state of mind during your loved one's stay in the ICU. How was it at admission and how did it change over time?
Describe how mobile you were during your stay and how that changed, if at all. Prompts: Could you reposition yourself? Could you move yourself up in bed? Could you sit up? Etc.	Describe how mobile your loved one was during the stay and how that changed, if at all. Prompts: Could s/he reposition him/herself? Could s/he move him/herself up in bed? Could s/he sit up? Etc.
Describe any routines that you remember from your stay in the ICU. That is anything that was repeated like getting medications.	Describe any routines that you remember from your loved one's stay in the ICU. That is anything that was repeated like getting medications.
Describe, in detail, the steps when a new nurse came to care for you for the day or for the night. For example, first the nurse said hello and asked how I was doing. Then the nurse did so and so etc.	If you were present for nurse shift changes, describe, in detail, what happened. For example, first the nurse said hello and asked how (the patient) was doing. Then the nurse did so and so etc.
What do you know about bedsores?	
What did anyone in the ICU or in the hospital tell you about bedsores?	

All interviews were recorded on five recorders for data safety and clarity, were transcribed verbatim, and deidentified at both hospital and individual level. Both patients and families expressed concerns for confidentiality several times when they thought they were disclosing socially undesirable information or reporting information about the hospital or health care staff that might impact future treatment options. Repeated assurances were made throughout the process. The subject pronouns *he* and *she* and *his* and *her* were merged to *s/he* and *his/her* to add another level of confidentiality. Reasons for admission were generalized. Also, all participants were given the option to review the recordings and to request partial or complete deletion. No participants made review or deletion requests.

Data Analysis

All interview transcriptions were imported into Atlas.ti version 8.4.4 (1135).[55] Once imported transcripts were read and reviewed by the investigators, an iterative process of coding, sorting, categorizing, and constant comparison were used to reveal categories.

Analysis was guided by the analytic techniques of grounded theory as outlined by Charmaz (2006).[30] Using Atlas.ti version 8.4.4 (1135)[35], data were coded inductively line by line to avoid imposing preconceived notions and to avoid becoming immersed in the respondents' worldviews without questioning them.[30] Second phase of analysis involved focused coding whereby the most frequent and/or significant codes were used to review larger data segments. This step condensed data which yielded potential categories to encompass data of similar meaning. Doing so allowed comparing experiences, actions, and interpretations across interviews. Categories may encompass several codes and explicate ideas, events, or processes in the data. Where categories appeared thin, purposeful theoretical sampling was used to complete properties in line with the developing explanation. Saturation was reached when additional data

did not inspire new insights. Theoretical coding then specified possible relationships between conceptual categories that helped develop an analytic story.

Memo writing was an important analytic tool employed throughout. At all analytic levels the constant comparative method was applied. Part of the constant comparative method was the iterative return to data for comparison to ensure that all analysis was still grounded in the data. A second person was intimately immersed in the data and reviewed emerging categories.

Results

A total of 18 patients and families participated in 13 interviews consisting of six dyads and six individual interviews. A husband and wife made up the patient and family dyads while individual interviews were conducted with either a patient or a family member. All patients had been released from the ICU at the time of the interview. Patient participants (n=9) were predominantly white (67%, n=6), and had a mean age of 52 years ±16 years, and an average ICU length of stay of three days ± 2.2 days. Family participants (n=9) were predominantly white (55%, n=5) with a mean age of 49 years ± 14 years. An average lapsed time between ICU stay and interviews was seven months ± 5.5 months (0.25-18 months). Community hospital participants made up 55.5% (n=10) of participants. Planned admissions were for neurosurgery, cardiac surgery, facial surgery, and cardiac catheterization and made up 36% (n=4) of ICU admissions. Other reasons for admission per participant reports were hypotension, trauma, hemorrhage, sepsis, and respiratory complications in three patients (27%, n=3). All patients, except one, had made a full recovery at the time of the interviews. One family participant reported that his/her spouse had passed away six months prior to the interview due to complications related to cancer. The same patient was the only participant who had reportedly suffered a stage 2 PI during the ICU stay. Table 1 presents participants' demographic data.

An explanation of *prioritizing in crisis* captured the overall experience and process patients and families lived during their time in the ICU. Three independent conceptual categories sat within this explanation and reflect how this stakeholder group strategized and prioritized needs and tasks, including PIP, during their ICU journey. The conceptual categories were preconceptions, transition points, and prioritizing. Preconceptions affect how individuals interpret transitions in their realities. How transitions are presented and interpreted determine decision making and prioritizing which includes the degree of engagement in PIP. A process map of the conceptual categories is depicted in Figure 1.

Preconceptions and Misconceptions

Preconceptions are mental biases that affect one's interpretation, judgment, and understanding of events. When preconceptions arise prior to formal instruction through interaction with the environment, they are called naïve preconceptions, such as a child's preconceptions of moon, stars, and the sun or a lay person's preconceptions of PIs. [36,37] Naïve preconceptions may be accurate or inaccurate. Misconceptions are preconceptions that are incompatible with currently accepted scientific understanding and form during and after formal instruction in the topic.[38,39] An important factor that affects learning is what the learner already knows. Before attempting interventions or instruction in any subject matter, what is already known must be elicited first. This step will reveal whether there are any naïve preconceptions. If there are any, which must be strengthened and which must be restructured will be known. If individuals have had any instruction in the topic already, eliciting what is known will reveal preconceptions that are accurate and misconceptions.[40] How the preconceptions and misconceptions of patients and families affect their interpretation of events in the ICU will guide them to engaging or disengaging with PIP.

Experiencing the ICU. Learning patients' and families' preconceptions of the ICU further elucidates their level of engagement with PIP. ICUs were this stakeholder's last hope in moments of crisis where they had to relinquish control and had to rely on strangers to keep them safe. All patients and families reported to value their respective ICUs: "it was a bit scary to be honest […] But it was a great experience in the ICU. I didn't even want to leave" PFA6. A general understanding was that ICUs had some unpleasant aspects which they had to accept, such as placing intravenous lines, constant alarms, and minimal sleep and rest. Several participants reported that staff spent much of their time on computers and other electronic devices and little time was spent inside patient rooms which was perceived as feeling detached. All ICU experiences were described to have evoked anxiety and uncertainty, because participants were fearing for their own or their loved one's lives, were worried about responsibilities that were left unattended outside the hospital, and concerns of leaving loved ones behind. Family participants described their ICU experiences lengthier and more tormenting than patient participants, because patients were undergoing surgery or were unconscious in the unit. One family participant described it as the "worst time" in their lives that "seemed like an eternity" which still caused nightmares about losing the loved one (PFAH1).

Understanding of PIs. The majority of participants reported preconceived notions about PIs prior to hospitalization. One patient participant had not heard of PIs before admission to the hospital and before undergoing preoperative care. Another had no knowledge of PIs until discussed during the interview. Participants' prevailing preconception was to associate PIs, which participants knew as bedsores, with bedbound, elderly, and frail skilled nursing facility (SNF) residents only. Their preconceived notions were based on media and experiences with bedbound friends or family members: "You remember that movie where she was a model or

something. It's really old. Anyway, somehow, she ended up bedridden and I think she ended up with those" PFC7. One family participant was a nursing assistant and therefore had formal training in PIs. S/he also believed PIs were only a SNF issue.

When participants were presented skin health-related questions, they were surprised and sometimes irritated. Responses indicated that some participants felt that skin health was irrelevant and that investigators were minimizing their experiences. Participants also admitted that they would have found it strange if ICU staff had discussed skin health and that they consequently would have questioned the quality of the hospital: "Honestly, I still don't see the point. Skin seems like something you go to the doctor for like your personal doctor in an office, you know. Not the hospital. You don't get admitted to the hospital because your skin is hurting" PFC2. These reports indicate that patients and families had mostly inaccurate preconceptions about PIP and that they did not understand its importance in the ICU.

Preconceptions of CCRNs. Patients and families valued most CCRNs highly and considered them to be an important aspect of their recovery. Although questions presented about staff early during interviews were generalized, participants' initial responses and tones were protective of CCRNs. During an experience that was unpredictable and unfamiliar, CCRNs were reported as a constant. In moments of crisis when patients were fearful for life and were in pain, patients and families explained that CCRNs made them feel safe: "I remember feeling very cared for and safe. Staff was very attentive. I was not worried, that's how good the care was while I was even in that state" (PFA5). One family participant proposed to thank CCRNs and ICU physicians for their service in public much like was the custom with armed forces indicating a feeling of indebtedness and gratitude for keeping them safe and alive.

When CCRNs predicted and fulfilled patients' and families' physical and comfort needs, it decreased participants' suffering and made them feel like they were cared for beyond the critical condition that brought them into the ICU. Examples were providing extra blankets, pillows, drinks, snacks, and conversations. A family participant noted that a pillow and Jello may seem banal, but they helped them feel connected to the nurses, allowed them a few moments of rest, and gave them something to do: "I took my time with that Jello. I scraped every bit of it. I don't even like Jello" (PFAH2). Although especially families perceived CCRNs and the unit to always be busy, they remarked that nurses kept the unit calm. During, what patients perceived to be some of their most vulnerable states, they reported CCRNs to normalize the experience which decreased their anxiety. An example that both family and patient reported separately was having uncontrolled bowel movements that required relinquishing privacy and control. Especially male patients appreciated this normalizing steadiness that CCRNs provided when they felt panicked and out of control: "I felt like I couldn't move my body, but especially my upper body. It just felt frozen. So, yes, the nurses were helping me […] I called them in panic" (PFA6). Most participants were ambivalent on whether physicians or CCRNs should provide patient education on important topics: "I think the nurses have the opportunity while physicians have the authority" PFC3.

Preconceptions of Providers. Pervasive in all reports was patients and families being in anticipation for their physicians to see and update them. Participants expressed gratitude for physicians optimizing their health to a state that enabled them to leave the ICU and eventually the hospital: "I think that we, as a society, just listen more to physicians rather than nurses, especially, I think, in the ICU. You're basically depending on the physician for survival, it feels like, right?" PFC3. A family participant appreciated the physician's honest prognosis beyond the

spouse's hospital episode which provided the family the opportunity to put their affairs in order. Communication with physicians was explained as challenging, because they were busy and could only spend minutes at a time in patient rooms with minimal interaction. Patients and families reported feeling overwhelmed by the short visits although they were anxiously waiting for them:

> "Honestly, the questions always came up after he left. You know how it goes. The doctors kinda just dump information on you and then disappear. It's almost like you don't really hear them until they're gone and of course then it's too late and you may as well not call them or ask for them because it's impossible to get them back into your room once they leave" PFC3.

Most patients and families preferred physicians to provide education on important topics but noted that they were too busy: "You know we listen much more to doctors than to other people like nurses. No offense […] But, man, again, I just CAN'T imagine them doing even the education when I couldn't get them to stay in the room for a few minutes" PFC2.

Transition Points

Transition points can be short or lengthy depending on the perception of the person experiencing them. Some may be by design, such as a planned ICU admission, or they may be sudden, like an ICU admission due to trauma sustained in a car accident. Even within the planned transition, a plethora of unplanned transitions can occur, especially in unfamiliar circumstances like hospitalizations. If the person is left with experiencing the transition without outside influence, s/he will rely on previous experiences to cope. Preconceptions and misconceptions can however still be affected by interactions with the environment. Where on the continuum between engagement and disengagement with PIP patients and families find

themselves, depends on how they interpret these transition points. Subcategories that affect how transition points are interpreted are discussed further.

Level of knowledge and skill. How an individual interprets a transition depends on the level of knowledge and skills the person can apply to the situation. All but one participant demonstrated a large knowledge deficit regarding PIs and PIP. One participant, also a nursing assistant, had working knowledge of PIs. Interview questions aimed to elicit how and to what extent health care staff imparted PIP-related knowledge and skills during the ICU stay. Only one patient and family participant recalled a CCRN insisting on a routine of repositioning and bathing while mentioning skin health but without thoroughly communicating importance and rationale:

> "The only thing I heard about skin was from that little angryish nurse and even that was just, I don't know what that was. I just listened, so she'd stop bugging me (laughter). There was no explanation, no: Oh, let me educate you. No flyer" PFC4.

Other questions aimed at learning whether patients and families were made aware of PIP and risks of PIs indirectly by means of informational pamphlets, whiteboards in patient rooms, or posters in the unit, for example. No participants recalled making such observations:

> "No, and I would've noticed them, because there wasn't a thing on the walls, in the drawers, or anywhere that I didn't read. I was there for a few hours at a time and mom would sleep sometimes for a good portion of it. So, I basically was staring literally at the walls" PFA5.

Urgency. Individuals applied their preconceptions to interpret the degree of urgency to the transitions they were experiencing. In addition to preconceptions, the way that these

transitions were presented, affected their interpretations. Participants demonstrated greater attention to tasks and events that were in line with their preconceptions of ICUs as a place of worry, busyness, hectic, alarms, medication pumps, and saving lives:

> "It was horrible. God, I hate to remember it. When I got the call that he was in the hospital IN THE ICU. God, I lost it." PFC4.

Patients and families had a general unawareness of the significance of PIs and their prevention. They did not perceive skin health to be in line with their preconceptions of the ICU and consequently did not perceive any urgency around PIP-related tasks:

> "Wow. See, I just knew I couldn't leave your side. You're so focused on all the bells and whistles in the hospital, but more so in the ICU that, who would think about that? Jeez, I mean I didn't even know something like that [PIs] existed" PFC7.
>
> "That should be their responsibility. On top of that, I didn't even know about this thing that's apparently not an old people condition." PFC5
>
> "That's awful. Seriously. I wish that nurse would've told us all this rather than just keep the skin healthy and just keep repeating it." PFC4

Hence, participants who were in pain and fearful of damaging attached medical devices, such as chest tubes, did not want to engage in PIP while others were frustrated that skin was even addressed in the ICU:

> "why don't you worry about blood seeping through the bandages and me being dizzy rather than about my skin? I'll put some lotion on when I get out" PFC4.

Expectations. Most patients' and families' encounters with ICUs were unplanned and unexpected. Hence, their expectations formed based on preconceptions and information flow

during events that transpired in the ICU. Patients and families expressed an expectation of staff being knowledgeable and in control. When this expectation was not met, they associated it with missed care such as not repositioning patients on time or not at all:

> "I remember on the third day we had this little tiny nurse who was very young and just seemed overwhelmed really […] I felt bad for her but also concerned for us […] she had no place being there […] The lift team always talked to the nurse first and then went into the room [to reposition the patient]. Our nurse was, well, wasn't there. I'm not saying that she was drinking coffee, she was just busy. So, I think they have to move on" (PFA3).

Even when participants were formally educated in PIs or had working knowledge on the topic, such as a nursing assistant family participant, they were not expecting having to prevent PIs in the ICU:

> "honestly, I don't know why it would be a priority. My dad didn't have any skin issues. No wound or anything. I think people in the ICU, patients, they go in for really and scary issues, not skin" PFC1.

Participants were surprised and sometimes frustrated when they learned information about PIs, such as incidence rates in the ICU and risk factors, because they had not been informed during their hospitalization. One dyad reported a single nurse to insist on the patient being repositioned and bathed:

> "She kept saying and repeating […] We need to keep your skin healthy. We can't have you not move. I know it's hurting, but we have to move, we have to move. She was like a little broken record. Honestly, I'd just let her do it to just make her stop saying the same thing over and over again" PFC4.

Participants expressed how wary they were of suffering additional injuries while hospitalized in addition to their existing conditions. They explained that getting educated on rationale and consequences of PIP and being told to expect it as an ICU routine would increase their engagement and cooperation. This approach would also give them a sense of control over the experience.

> "it goes back to again if they had educated me at the beginning about these, these sores. I would work with them more if I knew how important it was, if I knew that I could actually get them, too. Maybe even hear statistics like you told me how patients in the ICU get more ulcers than elsewhere." PFC4.

Prioritizing

Participants had two sets of overlapping priorities: the first priority encompassed patients' and families' own perceived needs related to their physical and emotional vulnerabilities, such as pain control and reassurance. The second priority was to follow their physicians' and nurses' guidance to improve their status. Patients and families recognized ICU staff as a crucial source of support to address their vulnerabilities:

> "You're lost. We knew NOTHING about being in a hospital, let alone THE ICU! All you're looking for is a lifeline. You feel infantilized not just because you're butt-naked but you're afraid and you know nothing about anything. And in soooo much pain. Suddenly doctors and nurses are your gods. Like your best friend. You follow them anywhere and ANYTHING they tell you, you just say *yes, yes*. Just make it better" PFAH3.

CCRNs and physicians communicated priorities of care with their routines. All participants were asked to recount staff routines in detail. The primary routines that participants

reported were CCRNs' start of shift assessments, medication administration, and physician visits. Only one dyad recalled a single nurse prioritizing skin health. Physician visits were described as highly anticipated events during patients' and families' ICU stays.

Once the investigator informed participants of ICU incidence rates and explained the significance of PIs in ICUs, patients and families explained that they would have prioritized PIP if they had been educated and engaged in the process. They discussed that when CCRNs took the time to explain medical equipment, participants felt "finally useful" (PFAH2). They could focus their attention on something that contributed to their own or their loved one's recovery and helped ICU staff rather than lying around or sitting in the room or staring at walls. Given their PI knowledge deficit, patients and families recommended that multiple CCRNs and physicians should start communicating the importance of prevention early, plainly, and repeatedly. This approach would signify importance to participants and would also "plant a seed" (PFC4), increase retention, acceptance, and participation.

> "We were so, um, well, distraught, I don't know how much of it we would have absorbed, but that's ok, I think. You just do your job and, and even if we're not quite on board yet, you just turn the patient, and just keep repeating the information, you know. At some point it'll click. I mean, we did calm once her breathing was better" PFC6.

Patients and families admitted that they might not like PIP tasks being performed, such as being repositioned at two-hour intervals at night. They explained why CCRNs and physicians still had to insist on PIP as a priority in their daily routines:

> "I don't have to LIKE everything you do, right? I mean, for god's sake, I'm in the hospital! I don't like any of it. Not the bandages, not the smells, not the ding

> ding dings, the alarms. So, that's just another thing that has to get done because it's important. And who knows, maybe after a couple times of you helping me turn this and that way, it actually feels better" PFC4.

Other participants pointed out that in order to make PIP a priority for patients and families, CCRNs and physicians had to integrate it as a priority into their own workflow first in spite of competing priorities.

> "I mean how much time out of her stay was devoted to saving her life? So, I'm calling BS on that. Not that they're not saving lives and doing so much, but it's not 24 hours a day, right? It's like me saying I can't cook for my kids because I had to get them to school, make sure they're dressed, they did their homework, etc. etc. I mean but feeding them is part of all this, right?" PFA5.

Some also were fearful of delegating PIP tasks to anyone but CCRNs and physicians in an ICU setting:

> "Do you remember some of those patients who seemed like their whole room was full of medication poles? I wouldn't trust ANYONE but a nurse or doctor or someone knowledgeable to try to straighten out sheets or try to grab a tubing that my husband is lying on" PFA2.

Discussion

First, do no harm or *nonmaleficence* is one of the foundations of health care and an accepted ethical principle for both the nursing and the medical professions. Yet, ICU patients, who are among the most vulnerable among hospitalized patients, continue to be afflicted by avoidable PIs under our care. This study explored how the attitudes of ICU patients and families,

who are a major stakeholder group in this puzzle, affect PIP in the ICU. Participants offered rich descriptions of their ICU experiences. Figure 1 depicts the process by which patients and families engaged or disengaged with PIP in the ICU by applying their preconceptions and misconceptions to interpret transition points which explained how they prioritized their focus and tasks. The majority of participants demonstrated largely inaccurate or incomplete perceptions of PIs which remained unaltered during their hospitalizations. This study revealed that patients and families are open to being active participants in the prevention of PIs.

Patient and Family Preconceptions of PIs are Incomplete and Inaccurate

Patients and families have previously been reported as a barrier to PIP by CCRNs and ICU physicians. Reasons that this stakeholder group was sometimes considered a barrier were cited as pain or general discomfort, wanting to sleep, high body mass index, family interference, end of life considerations, physical resistance, agitation, other behavioral issues, refusal, and insistence on care that was not indicated or was futile.[27] It is important to understand patient and family PI knowledge and perspectives on PIP to evaluate whether their attitudes indeed are a barrier to preventing PIs.

Studies exploring patient perspectives on patient safety are scarce. Studies exploring patient perspectives on PIs and their prevention in any health care setting are even more limited while there is only one study on family and caregiver PI-related perspectives.[24,27,41,42,] The limited literature indicates that patients believe to understand what PIs are, but further responses indicate vast knowledge deficits and inaccurate preconceptions which this study reflects, as well.[41,42] Participants however were not provided any opportunities to change their inaccurate preconceptions, because patients and families reported minimal PIP activities and minimal engagement by staff. Supporting this finding are physicians and CCRNs reporting that they

rarely communicated with patients and families regarding PIP.[27] Patients and families were unaware that their preconceptions were inaccurate and relied on their trusted ICU staff to engage them when necessary. Indeed, families in the ICU have been reported to think that ICU staff did their job perfectly which was a reason for not participating in care.[43] In the current study, patients and families also were hesitant to ask questions, because staff appeared busy and participants did not want to interfere.

Identifying Preconceptions and Misconceptions About Mobility

CCRNs previously reported that they valued PIP and performed necessary tasks unless competing priorities prevented them. The most significant competing priority was the patient's critical status which they perceived meant they could not tolerate PIP.[27] Patient and family reports however stand in contrast, because participants did not recall many instances of PIP regardless of whether they were in a critical state or whether they were stabilized already. One reason might be that several family participants were intuitively repositioning and bathing patients for comfort without ICU staff prompting or guiding them. Other patients had the perception that they could move independently which they communicated to the ICU staff. Further probing however revealed that their perception was biased and often inaccurate, because they were sedated, unconscious, confused, or weakened according to their own or family reports. Because these non-elderly patients were verbal and interactive, staff may have underestimated their PI risk. Indeed, one patient developed sacral redness while another developed a stage 2 PI in the ICU. Supporting this hypothesis is that CCRNs' and providers' PIP-related attitudes indicated that conversational patients and those whom staff associated with non-ICU diagnoses, such as mild traumatic brain injuries or cardiac catheterizations, were considered low or not at risk for PIs in the ICU.[27] There is a knowledge asymmetry between patients, families, and ICU

staff. Patients and families cannot be expected to recognize and to accept that their pre-ICU tolerances and abilities may have decompensated. They might also feel uncomfortable approaching staff for assistance. Participants reported that they did not want to interfere with busy ICU staff and work and therefore stayed out of their way.

Engaging Patients and Families in PIP

In recent years, a shift away from paternalistic health care towards patient and family-centered care that includes active engagement has been advocated.[44-47] During unfamiliar ICU experiences, patients and families are more receptive to guidance in maneuvering the competing stressors. This is an opportunity for ICU staff to engage participants in care. In order to engage patients and families in PIP in the ICU, we must first learn whether they are willing and able to follow advice and to participate in the activities. There is currently a significant gap in research evidence around patient and family adherence to PIP guidance.[43,46] This study is a step in understanding the effects that patient and family PIP awareness has on their risk. Once the investigator informed participants on PI risks in the ICU, all patients and families reported positive attitudes towards engagement. They asserted that had they been educated during their ICU stay, they would have made efforts to be active participants in PIP. Similarly, as part of the most recent international clinical guideline development, an international survey of patients and caregivers showed that over 80% of respondents deemed PI education to be important or very important for their care.[52]

The need for clear communication and information and the issues that arise when communication is lacking was a prominent report in this and other studies.[48,49] For instance, participants always waited anxiously for their ICU physicians to visit although they felt overwhelmed, and although they were left with questions even after said visits. Nevertheless,

patient and family stakeholders proposed that ICU staff continued educating and involving participants. They suggested that information should be provided repeatedly and by several individuals even if participants did not like the PIP activities or if their condition was so acute that they were not actively listening. This approach would emphasize and communicate that these tasks were important. Especially knowledge gained about consequences of noncompliance were important to participants, because they could reference it whenever they felt bothered by PIP tasks and did not want to participate.

Finally, families of patients in the ICU are at high risk for post-traumatic stress disorder. Engaging them can help shift their focus to constructive tasks rather than periods of stressful waiting that participants reported.[43,49] The results of a systematic review and meta-analysis suggest that systematic information flow between ICU staff and families decreases length of stay without affecting mortality.[50] There is evidence suggesting that structured information delivery through verbal, written, or online means decreases family stress in the ICU.[51] Similarly, patients and families in this study welcomed written educational material that would prompt their engagement. Involving families and patients in care may also increase their understanding and appreciation of ICU processes and efforts.

Limitations and Strengths

Although the qualitative design of this study limits the generalizations of its findings, it was a necessary approach to gaining insights into a phenomenon that has not been explored thus far. While every effort was made to recruit patients and families who were representative of the different ICUs, the following factors imposed limitations: investigators decided to not recruit directly from ICUs to respect patients' and families' journeys. Also, as an average lapsed time

between ICU stay and interviews was seven months ±5.5 months, there is a possibility of errors in recalling information.

Despite these limitations, this study has some important strengths. As the sufferers of PIs and caregivers of those with PIs, patients and families are arguably the primary stakeholder group when considering PIP in ICUs. To our knowledge, this is the first time that their voices regarding PIP are explored in research. An attempt was made to learn the views of a wide range of patients by recruiting from four different hospitals. To build rapport and increase trust, participants were given the choice to review their taped interviews and to request deletion of portions or all content. This motivated participants to speak freely.

Conclusion

Despite the increasing emphasis on patient and family empowerment and engagement in ICU care, this study's findings suggest that an active role for this stakeholder group in the ICU is not common practice. Also, patients' and families' preconceptions about PIs are incomplete which can put them at increased risk for developing avoidable PIs in the ICU. In all instances, patients and families were open to receiving information and education on PIs and PIP especially when learning about consequences of suffering PIs. Findings of this study can inform much needed future research on patient and family perspectives regarding patient safety issues in ICUs.

TABLE 2. Characteristics of Intensive Care Unit Patients and Families

	All Participants n=18	**Patients n=9**	**Families n=9**
	Mean ± Standard Deviation or n(%)		
Age (years)	50±14	52±16	49±14
Range	32-78	32-78	35-74
Gender: % female	50	44	55
Ethnicity/Race :			
Black	0	0	0
Asian	1(5)	0	1(11)
White	11(61)	5(67)	6(55)
Hispanic	4(22)	2(22)	2(22)
Native American	2(11)	1(11)	1(11)
Education:			
Associate/Diploma	5(28)	3(33)	2(22)
Bachelor's Degree	8(44)	3(33)	5(55)
Master's Degree	3(17)	2(22)	1(11)
Doctoral Degree	2(11)	1(11)	1(11)
Length of stay (days)		2.8±1.7	
Range		1-7	

Length of time between ICU stay and interview (months)	7.4±5.5		
Range	0.25-18		

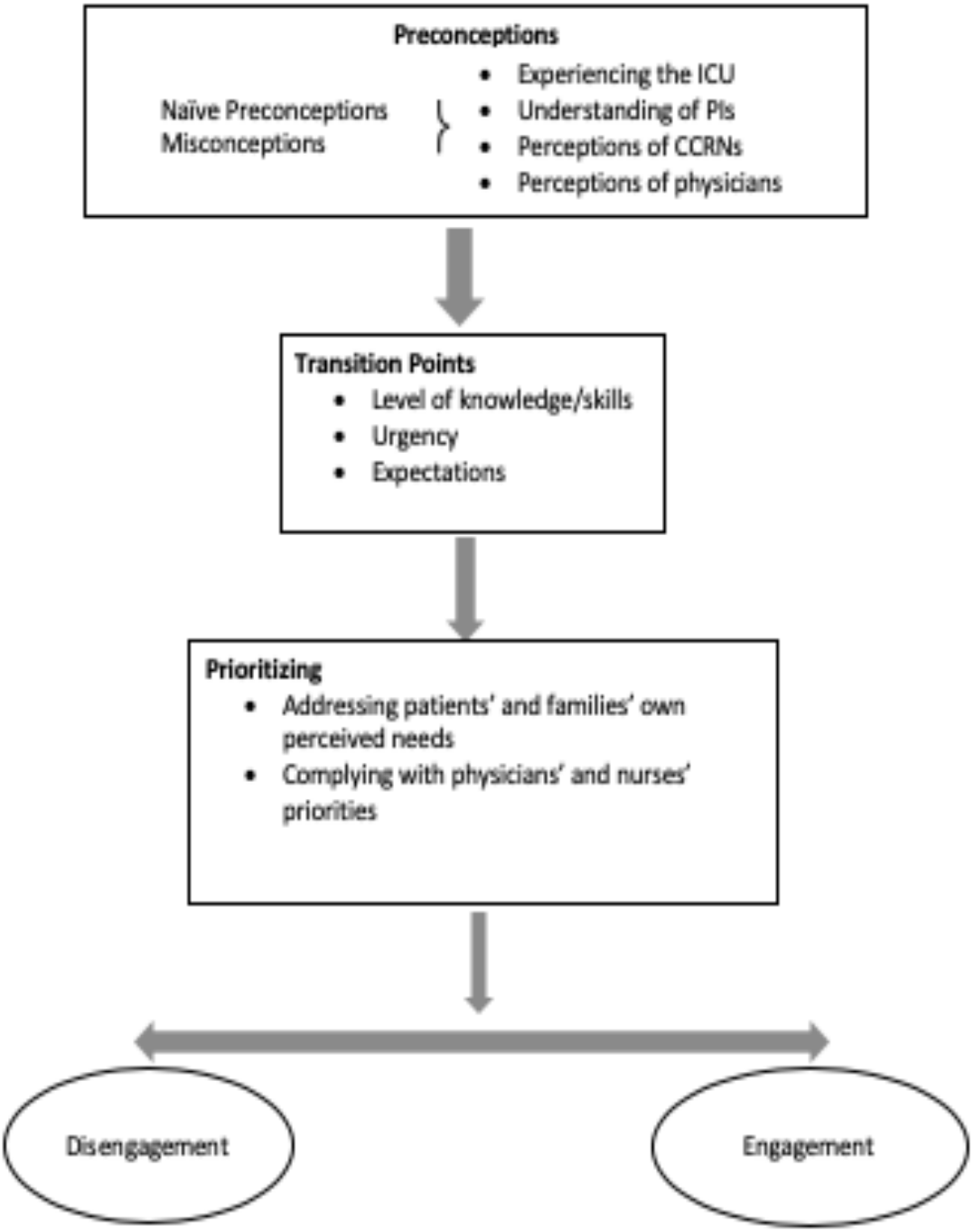

Figure 1. Explanation of Patients and Families Engaging and Disengaging with Pressure Injury Prevention in the ICU

References

1 Dealey, C., Posnett, J., & Walker, A. (2012). The cost of pressure ulcers in the United Kingdom. *Journal of Wound Care*, **21**(6), 261– 266.

2 Gorecki, C., Brown, J. M., Nelson, E. A., Briggs, M., Schoonhoven, L., Dealey, C., ... & Nixon, J. (2009). Impact of pressure ulcers on quality of life in older patients: a systematic review. *Journal of the American Geriatrics Society*, 57(7), 1175-1183.

3 Benoit, Jr., R. A., & Watts, C. (2007). The effect of a pressure ulcer prevention program and the bowel management system in reducing pressure ulcer prevalence in an ICU setting. *Journal of Wound Ostomy & Continence Nursing*, *34*(2), 163-175.

4 Compton, F., Hoffmann, F., Hortig, T., Strauss, M., Frey, J., Zidek, W., & Schafer, J. H. (2008). Pressure ulcer predictors in ICU patients: nursing skin assessment versus objective parameters. *Journal of Wound Care, 17*(10).

5 Langemo, D. K., Anderson, J., & Volden, C. (2004). Uncovering Pressure Ulcer Incidence. *Holistic Nursing Practice, 18*(1), 42-44.

6 VanGilder, M., Amlung, S., Harrison, P., & Meyer, S. (2009). Results of the 2008–2009 International Pressure Ulcer Prevalence™ Survey and a 3-year, acute care, unit-specific analysis. *Ostomy Wound Management, 55*, 39-45.

7 Whittington, K. T., & Briones, R. (2004). National prevalence and incidence study: 6-year sequential acute care data. *Advances in Skin & Wound Care, 17*(9), 490-494.

8 Shreve, J., Van Den Bos, J., Gray, T., Halford, M., Rustagi, K., & Ziemkiewicz, E. (2010). The economic measurement of medical errors sponsored by society of actuaries' health section. Milliman Inc.

9 Athlin, E., Idvall, E., Jernfält, M., & Johansson, I. (2009). Factors of importance to the development of pressure ulcers in the care trajectory: perceptions of hospital and community care nurses. *Journal of Clinical Nursing*, *19*(15-16), 2252-2258.

10 Langer, G., & Fink, A. (2014). Nutritional interventions for preventing and treating pressure ulcers. Cochrane Database of Systematic Reviews 2014, Issue 6. Art. No.: CD003216. DOI:10.1002/14651858.CD003216.pub2.

11 McInnes, E., Jammali-Blasi, A., Bell-Syer, S., Dumville, J., & Cullum, N. (2012). Preventing pressure ulcers—are pressure-redistributing support surfaces effective? A Cochrane systematic review and meta-analysis. *International journal of nursing studies*, *49*(3), 345-359.

12 Moore, Z., & Cowman, S. (2008). A systematic review of wound cleansing for pressure ulcers. *Journal of Clinical Nursing, 17*(15), 1963-1972.

13 Armstrong, D. G., Ayello, E. A., Capitulo, K. L., Fowler, E., Krasner, D. L., Levine, J. M.,…& Smith, A. P. (2008). New opportunities to improve pressure ulcer prevention and treatment: implications of the CMS inpatient hospital care present on admission indicators/hospital-acquired conditions policy: a consensus paper from the International Expert Wound Care Advisory Panel. *Advances in Skin & Wound Care*, *21*(10), 469-478.

14 Beeckman, D., Defloor, T., Schoonhoven, L., & Vanderwee, K. (2011). Knowledge and attitudes of nurses on pressure ulcer prevention: a cross-sectional multicenter study in Belgian hospitals. *Worldviews on Evidence-Based Nursing*, *8*(3), 166-176.

15 Dunleavy, K. (2008). Putting a dent in pressure ulcer rates. *Nursing 2008*, *38*(1), 20-21.

16 Young, J., Ernsting, M., Kehoe, A., & Holmes, K. (2010). Results of a clinician-led evidence-based task force initiative relating to pressure ulcer risk assessment and prevention. *Journal of Wound Ostomy & Continence Nursing*, *37*(5), 495-503.

17 AHRQ National Scorecard on Hospital-Acquired Conditions. Content last reviewed January 2019. Agency for Healthcare Research and Quality, Rockville, MD. http://www.ahrq.gov/professionals/quality-patient-safety/pfp/index.html

18 Bernard, M. (2002). Values as truisms: extensions and social consequences. School of Psychology Cardiff, University of Wales, Cardiff.

19 Pakizeh, A. (2005). Basic human values: implicit structure, dynamic properties and attitudinal consequences (Doctoral dissertation, Cardiff University).

20 Kingston, M. J., Evans, S. M., Smith, B. J., & Berry, J. G. (2004). Attitudes of doctors and nurses towards incident reporting: a qualitative analysis. *Medical Journal of Australia, 181*(1), 36-39.

21 Kossover-Smith, R. A., Coutts, K., Hatfield, K. M., Cochran, R., Akselrod, H., Schaefer, M. K., ... & Bruss, K. (2017). One needle, one syringe, only one time? A survey of physician and nurse knowledge, attitudes, and practices around injection safety. *American Journal of Infection Control, 45*(9), 1018-1023.

22 Rahimi, Y.; Bates-Jensen, B.M.; Pavlish, C.; Hodge, F. & Benharash, P. (2019). Major Stakeholders' Attitudes Towards Pressure Injury Prevention in Intensive Care Units – A Literature Review. Unpublished manuscript.

23 Latimer, S., Chaboyer, W., & Gillespie, B. (2014). Patient participation in pressure injury prevention: giving patient's a voice. *Scandinavian Journal of Caring Sciences*, *28*(4), 648-656.

24 Roberts, S., Wallis, M., McInnes, E., Bucknall, T., Banks, M., Ball, L., & Chaboyer, W. (2017). Patients' perceptions of a pressure ulcer prevention care bundle in hospital: A qualitative descriptive study to guide evidence-based practice. *Worldviews on Evidence-Based Nursing, 14*(5), 385-393. doi:http://dx.doi.org/10.1111/wvn.12226

25 Gorecki, C., Brown, J. M., Nelson, E. A., Briggs, M., Schoonhoven, L., Dealey, C., ... & Nixon, J. (2009). Impact of pressure ulcers on quality of life in older patients: a systematic review. *Journal of the American Geriatrics Society*, *57*(7), 1175-1183.

26 Hopkins, A., Dealey, C., Bale, S., Defloor, T., & Worboys, F. (2006). Patient stories of living with a pressure ulcer. *Journal of Advanced Nursing*, *56*(4):345-53.

27 Rahimi, Y.; Bates-Jensen, B.M.; Pavlish, C.; Hodge, F. & Benharash, P. (2019). Ethnography of Critical Care Nurses' and Providers' Attitudes Towards Pressure Injury Prevention in Intensive Care Units. Unpublished manuscript.

28 Bamkin, M., Maynard, S., & Goulding, A. (2016). Grounded theory and ethnography combined: A methodology to study children's interactions on children's mobile libraries. *Journal of Documentation*, *72*(2), 214-231.

29 Bikker, A. P., Atherton, H., Brant, H., Porqueddu, T., Campbell, J. L., Gibson, A., ... & Ziebland, S. (2017). Conducting a team-based multi-sited focused ethnography in primary care. *BMC medical research methodology*, *17*(1), 139.

30 Charmaz, K. (2006). *Constructing grounded theory: A practical guide through qualitative analysis*. sage.

31 Knoblauch, H. (2005). Focused Ethnography. In *Forum Qualitative Sozialforschung/Forum: Qualitative Social Research, 6*(3).

32 Beeckman, D., Defloor, T., Demarré, L., Van Hecke, A., & Vanderwee, K. (2010). Pressure ulcers: Development and psychometric evaluation of the Attitude towards Pressure ulcer Prevention Instrument (APuP). *International Journal of Nursing Studies*, *47*(11), 1432-1441.

33 Kalisch, B. J., Landstrom, G., & Williams, R. A. (2009). Missed nursing care: errors of omission. *Nursing Outlook*, *57*(1), 3-9.

34 Moore, Z., & Price, P. (2004). Nurses' attitudes, behaviours and perceived barriers towards pressure ulcer prevention. *Journal of Clinical Nursing*, *13*(8), 942-951.

35 Atlas.ti [Computer software]. (2019). Retrieved from https://atlasti.com/?_ga=2.53164520.111507272.1573435992-1602802777.1573435992

36 Badenhorst, E., Mamede, S., Abrahams, A., Bugarith, K., Friedling, J., Gunston, G., ... & Schmidt, H. G. (2016). First-year medical students' naïve beliefs about respiratory physiology. *Advances in Physiology Education*, *40*(3), 342-348.

37 Jankowska, D. M., Gajda, A., & Karwowski, M. (2019). How children's creative visual imagination and creative thinking relate to their representation of space. *International Journal of Science Education*, *41*(8), 1096-1117.

38 Clement, J., Brown, D. E., & Zietsman, A. (1989). Not all preconceptions are misconceptions: finding 'anchoring conceptions' for grounding instruction on students' intuitions. *International journal of science education*, *11*(5), 554-565.

39 Kambouri, M. (2016). Investigating early years teachers' understanding and response to children's preconceptions. *European Early Childhood Education Research Journal*, *24*(6), 907-927.

40 Cohen, J. D., Jones, W. M., & Smith, S. (2018). Preservice and early career teachers' preconceptions and misconceptions about making in education. *Journal of Digital Learning in Teacher Education*, *34*(1), 31-42.

41 Latimer, S., Chaboyer, W., & Gillespie, B. (2014). Patient participation in pressure injury prevention: giving patient's a voice. *Scandinavian Journal of Caring Sciences*, *28*(4), 648-656.

42 McInnes, E., Chaboyer, W., Murray, E., Allen, T., & Jones, P. (2014). The role of patients in pressure injury prevention: a survey of acute care patients. *BMC nursing*, *13*(1), 41.

43 Azoulay, É., Pochard, F., Chevret, S., Arich, C., Brivet, F., Brun, F., ... & Garrouste-Orgeas, M. (2003). Family participation in care to the critically ill: opinions of families and staff. *Intensive Care Medicine*, *29*(9), 1498-1504.

44 Davidson JE, Aslakson RA, Long AC, Puntillo KA, Kross EK, Hart J, Cox CE, Wunsch H, Wickline MA, Nunnally ME, Netzer G, Kentish-Barnes N, Sprung CL, Hartog CS, Coombs M, Gerritsen RT, Hopkins RO, Franck LS, Skrobik Y, Kon AA, Scruth EA, Harvey MA, Lewis-Newby M, White DB, Swoboda SM, Cooke CR, Levy MM, Azoulay E, Curtis JR (2017) Guidelines for family-centered care in the neonatal, pediatric, and adult ICU. *Critical Care Medicine, 45,* 103–128.

45 Kon AA, Davidson JE, Morrison W, Danis M, White DB (2016) Shared decision making in ICUs: an American College of critical care medicine and american thoracic society policy statement. *Critical Care Medicine, 44,* 188–201.

46 Ledger, L., Worsley, P., Hope, J., & Schoonhoven, L. (2020). Patient involvement in pressure ulcer prevention and adherence to prevention strategies: An integrative review. *International Journal of Nursing Studies*, 103449.

47 Rathert, C., Brandt, J., & Williams, E. S. (2012). Putting the 'patient'in patient safety: a qualitative study of consumer experiences. *Health Expectations*, *15*(3), 327-336.

48 Auerbach, S. M., Kiesler, D. J., Wartella, J., Rausch, S., Ward, K. R., & Ivatury, R. (2005). Optimism, satisfaction with needs met, interpersonal perceptions of the healthcare team, and emotional distress in patients' family members during critical care hospitalization. *American Journal of Critical Care*, *14*(3), 202-210.

49 Hoffmann, M., Holl, A. K., Burgsteiner, H., Eller, P., Pieber, T. R., & Amrein, K. (2018). Prioritizing information topics for relatives of critically ill patients. *Wiener klinische Wochenschrift*, *130*(21-22), 645-652.

50 Lee, H. W., Park, Y., Jang, E. J., & Lee, Y. J. (2019). Intensive care unit length of stay is reduced by protocolized family support intervention: a systematic review and meta-analysis. *Intensive Care Medicine*, 1-10.

51 Giannouli, V., Mistraletti, G., & Umbrello, M. (2017). ICU experience for patients' relatives: is information all that matters?. *Intensive Care Medicine*, *43*(5), 722-723.

52 NPUAP/EPUAP. (2019). National Pressure Ulcer Advisory Panel, European Pressure Ulcer Advisory Panel and Pan Pacific Pressure Injury Alliance. (3rd d.).

53 Van Den Bos, J., Rustagi, K., Gray, T., Halford, M., Ziemkiewicz, E., & Shreve, J. (2011). The $17.1 billion problem: the annual cost of measurable medical errors. *Health Affairs*, *30*(4), 596-603.