Improving Nurse Assessment and Documentation of Pressure Injuries in Patients with Dark Skin Tones: A Quality Improvement Project

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Abstract

Patients with dark skin tones (DST) are subject to healthcare disparities related to inadequate skin assessments with pressure injuries (PI) recognized at later stages which cause delayed treatment and underdiagnosed comorbidities, delayed intervention strategies, increased hospital stay, and mortality (Sommers et al., 2009; McCreath et al., 2016; Bates-Jensen et al., 2017). The organization struggled in the accurate nurse assessment and documentation of deep tissue injuries (DTIs) in DST. Current guidelines recommend regular PI education with assessment techniques and documentation of PI characteristics and terms specific to darkly pigmented skin (EPUAP et al., 2019). The overarching purpose of this quality improvement project was to decrease PI, specifically DTI, rates, severity, morbidity, mortality, and healthcare disparities among UW Health patients with DST. The specific aim was to target the organizational and professional factors that contribute to the complex relationship with direct patient outcomes. A multi-modal approach was developed and guided by the SEIPS 2.0 Work System Model for the implementation of nurse educational resources, guideline recommended documentation terminology and tool adoption, and organizational buy-in. Outcomes included organization tools and resources, buy-in and culture awareness, as well as nurse awareness, perception, and beliefs, training and education, resources and tools, and competencies. The project findings correlated with the literature that nurse PI education and resources were not inclusive of DST at the academic and organizational levels. Educational resources improved nurse awareness of healthcare disparities, knowledge, and perceived comfort and confidence in DST assessment and documentation. Implications for practice include the need for nurse education, inclusion of terminology and tools, and organizational cultural awareness of PI in patients with DST.

Key Words: pressure injury, dark skin tone, Munsell Color Chart, nurse education

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Dedication

I dedicate this scholarly project to my husband, Andrew, for his continued support and faith in me throughout the doctoral program and scholarly project. Thank you for your technology support, feedback and ideas, and company during the late homework nights.

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Improving Nurse Assessment and Documentation of Pressure Injuries in Patients with Dark Skin Tones: A Quality Improvement Project

Pressure injuries (PI) are "localized damage to the skin and/or underlying soft tissue as a result of pressure or pressure in combination with shear…usually occurs over a bony prominence but may also be related to a medical or other object" (European Pressure Ulcer Advisory Panel [EPUAP], National Pressure Injury Advisory Panel, & Pan Pacific Pressure Injury Alliance, 2019, p. 16). Individual specific risk factors for PIs include older age, Black race or Hispanic ethnicity, male gender, lower body weight, cognitive impairment, physical impairments, and comorbidities that affect soft tissue integrity and healing (Bauer et al., 2016; Qaseem et al., 2015). These comorbidities include urinary or fecal incontinence, diabetes, edema, impaired microcirculation, hypoalbuminemia, and malnutrition (EPUAP et al., 2019; Qaseem et al., 2015). The prevalence of PIs in the United States (U. S.) range from 0.4% to 38% in acute care hospitals, 2% to 24% in long-term care facilities, and 0% to 17% in home care settings (Qaseem et al., 2015).

Hospital Acquired Pressure Injuries (HAPIs) occur in both inpatient general care and specialty care areas such as intensive care units and affect over 2.5 million patients in the United States (Health Research & Educational Trust, 2016). HAPIs result in direct patient harm and long-term complications including pain, risk of infection and sepsis, costly treatments, increased length of stay, and premature mortality. Length of hospital stay increased up to five-fold for patients with a HAPI (Fogerty et al., 2009; Johnson & Schmotzer, 2019). Approximately 60,000 Americans die annually as a direct result of PI complications annually (Health Research & Educational Trust, 2016; Johnson & Schmotzer, 2019).

Hospital-acquired pressure injuries directly impact healthcare organizations. Organizational quality metrics, such as the National Database of Nursing Quality Indicators (NDNQI) including HAPI rates, affect accreditation. The American Nurses Credentialing Center (ANCC) Magnet® Recognition Program is an elite accreditation for hospitals that exhibit nursing excellence and optimal patient outcomes. Magnet® organizations improve nurse retention and satisfaction, patient safety and outcomes, business growth, and financial success (ANCC, 2017). All inpatient organizations are required to report the HAPIs stage 2 and above. In order to obtain or maintain Magnet® ANCC accreditation, over 50% of inpatient units have to be in the green status for two years prior to application or reapplication. The green status is determined by the Magnet® vendor national database which compares data to cohort group of like hospitals (ANCC, 2017; J. Monfre, personal communication, July 10, 2020; Montalvo, 2007).

Treatment of HAPIs is costly and "never-events" in which health insurance agencies may not reimburse for the care nor hospitalization costs related to a HAPI (Agency for Healthcare Research and Quality [AHRQ], 2014). The U. S. Centers for Medicare and Medicaid Services does not reimburse for care related to patients who develop a Stage 3 or 4 HAPI (Centers for Medicare & Medicaid Services [CMS], 2020a). Under the Hospital-Acquired Condition (HAC) Reduction Program, payments are reduced by one percent for hospitals with a Total HAC score in the worst-performing quartile. Pressure injury rates are a measured Patient Safety Indicator factored into the Total HAC score (CMS, 2020b). The cost of treating a single full-thickness pressure injury can be as high as $70,000 and the U. S. spends $11 billion annually in pressure injury treatment (Sen et al., 2009).

As the American population demographic continues to change rapidly, healthcare disparities and needs will be of utmost relevance. By the year 2050, individuals with darker skin tones (DST) will make up over half of the U.S. population. This includes, but is not limited to, the following races and ethnicities: Africans, African Americans (AA), Asians, Native Americans, and Hispanics (Cowan et al., 2018, November 14). Health care disparities exist in the U.S., and research is starting to highlight the disparities surrounding PIs in DST. After controlling for age and gender, AA had a significantly higher odds ratio of 2.26 for discharging with PI compared to Caucasians. Of U.S. patients with a hospital discharge diagnosis of PI, 32% were AA (Fogerty, 2009). Data from 2008-2012 showed Stage 3 and 4 PI rates among patients with DST were higher in men and 2.4% and higher in AA compared to all races. The risk of having a PI does not appear to be caused by health access nor zip code income, but it is still unknown why predominantly younger male AA are at higher risk for PIs at discharge. It is suggested that this is related to the higher odds ratio of AA inpatients for all 28 of the high-risk clinical classification software AHRQ diagnoses that are associated with an odds ratio >2 for PIs (Fogerty, 2009). Patients with DST have a higher mortality from PIs compared to patients of lighter skin tones (Black, 2018). The mortality rate for AA is 9.1% compared to 1.8% for Caucasian patients with an odds ratio of 5.08 (National Pressure Injury Advisory Panel [NPIAP], 2020, May 21).

Accurate assessments are imperative given the growing evidence that patients with DST have disproportionally higher PI mortality rates (Lyder, 2009). Healthcare providers are missing the earlier stages of PIs which restrict timely interventions to prevent full thickness injuries (Fogerty, 2009). This is attributed to relatively easier visual cues for changes in skin appearance observed in Caucasian skin but harder to spot visual signs of changes in pressure damage on

darker pigmentation (EPUAP et al., 2019). In a quality improvement study involving nursing home staff education, no Stage 1 PIs in Black residents were identified, while 31.6% of all documented PIs in Caucasian residents were a Stage 1 (Rosen et al., 2006). Deep tissue injuries (DTI) and Stage 1 PIs were most difficult for providers to identify and document on DST. Deep tissue injuries are classified by the NPIAP as persistent non-blanchable deep red, maroon or purple discoloration", either intact or non-intact skin, often with pain and temperature changes preceding skin color changes. "Discoloration may appear differently in darkly pigmented skin" (EPUAP et al., 2019, p. 206). The presentation of DTIs in DST individuals varies in color characteristics: 70% purple, 14% gray, 10.8% black, 9.1% brown, 5.9% blue, 5.4% maroon (Sullivan, 2014). Pain is a key symptom in PI assessment, especially in DST (Black et al., 2016). Black and Asian patients experience more PI related pain with decreased appetite compared to Caucasians (Gorecki et al., 2011). Healthcare disparities among patients with DST is linked to inadequate skin assessments with PIs recognized at later stages which causes delayed treatment and underdiagnosed comorbidities, delayed intervention strategies, increased hospital length of stay and mortality (Sommers et al., 2009; McCreath et al., 2016; Bates-Jensen et al., 2017).

Project Setting

This quality improvement project took place at the University of Wisconsin (UW) Hospital in Madison, Wisconsin, a 505-bed tertiary care facility and academic medical and regional referral center. The project sample population included inpatient nurses from four identified intensive care units (ICU) with the highest rates of PI and the organization unit-based Resources in Skin Care (RISC) nurses. This project aligned with organizational incentives to decrease PI and the vision to minimize healthcare disparities. The heightened national awareness of the Black Lives Matter (BLM) movement, organizational expansion of

the Office of Diversity, Equity, and Inclusion (DEI), and updated UW Health (UWH) vision as "a leader in dismantling racism in ourselves, in our system and in our community" in July 2020 suggested organizational readiness and internal motivation for change. The organization Fiscal Year 2021 Strategies and Tactics included the expansion of professional development and training programs and the integration of equity tools into decision-making and operation processes to meet the goals for an anti-racist and inclusive culture, equitable healthcare delivery system, and reduction in health inequities (UW Health, 2020d).

Assessment and Documentation Roles

In the adult inpatient units at UW Health, nurses are the healthcare providers responsible for assessing, staging, documenting, and consulting Certified Wound Care Nurses, called Wound, Ostomy, and Continence Nurses (WOCN). The Wound, Ostomy, and Continence (WOC) department is a team of four full time and one per diem WOCN. Each adult inpatient unit has a RISC nurse. The 60 organizational RISC nurses are trained by the WOC Clinical Nurse Specialist (CNS) on pressure injury prevention, assessment, documentation, and treatment of non-surgical wounds, as well as ordering appropriate support surface equipment and wound dressing materials. RISC nurses complete monthly skin audits on all patients on their unit to define the number and stage of PIs (both community and hospital-acquired). Respiratory therapists play a shared responsibility with nurses to move respiratory equipment and monitoring devices and documenting related injuries, but do no stage PIs. Nursing Assistants are often present for the two-person skin assessments on admission and unit transfers to identify skin abnormalities and wounds, but do not stage PIs nor document. They play a pivotal role in implementing prevention strategies and monitoring for signs of concerning skin to notify nurses. Physicians assess identified skin abnormalities and/or PIs when nursing expresses concern,

specifically when drainage is concerning for infection or blood loss. See Appendix A for further details on the current state and root cause analysis.

Education and Resources

The organization has a Nursing Practice Guideline for Prevention and Treatment of Pressure Ulcers/Injuries (2018) for guidance in risk factor assessment, skin and tissue assessment, preventive skin care, and emerging therapies for prevention of PIs. This does not include resources specific to DST. Bedside and RISC nurses have available electronic resources on the organization's intranet Uconnect on the WOC page. However, there is not a specific guide for the assessment, staging, nor documentation of PIs in DST. Although there are pictures of DST in sections of an optional NDNQI Pressure Injury Training 7.0 module, there are no images of DTIs in DST and how to correctly identify versus potential differentials.

Electronic Health Record Documentation

The organization has current practices and policies specific to the system-wide evidence-based Pressure Injury Prevention (PIP) bundle. The components of this bundle are integrated throughout the flowsheet documentation and nursing PIP bundle compliance is evaluated to identify areas warranting improvement in the prevention of HAPIs. A complete and compliant PIP bundle includes nursing interventions related to risk assessment, skin assessment, patient mobility, medical devices, activity, sensory perception, moisture, friction and shear, and nutrition (UW Health, 2019a).

An upcoming wound module within the electronic health record (EHR) is anticipated to go live in February 2021. This module will function as an all-encompassing area in which all disciplines will use for documentation across care areas and encounters. The goal is to allow for more consistent wound assessments and interventions, easier billing, and to offer tools that

readily trend wound data related to healing and progress. This is an opportunity to include inclusive and evidence-based guideline recommended language specific to DST into a new EHR function that will address and improve current gaps in documentation and practice.

Organizational Guideline

The organization has a nursing guideline specific to PIs. The guideline titled Prevention and Treatment of Pressure Ulcers/Injuries adopted the international EPUAP et al. (2019) guideline recommendations for prevention, intervention, and treatment of PIs. The recommendations do not address or include needs specific to DST and DTIs. The organizational nursing guideline identifies seven patient populations at heightened risk for PIs and with specific needs related to PIs. Darker skin tone populations are not addressed among the seven identified populations (UW Health, 2018).

Recent Initiatives

UW Health has implemented several policies and procedures in an effort to minimize the prevalence and severity of HAPIs. A two-person skin assessment was implemented in July 2019 for thorough patient skin assessment upon hospital admission or transfers within the organization. Findings are documented in a nursing admission or transfer note (UW Health, 2019b). As expected, the new process and documentation has increased the number of documented PIs (J. Monfre, personal communication, July 10, 2020). In early 2019, the organization implemented monthly posters, called Mid Shift Tidbits, disseminated in inpatient nursing unit breakrooms and the most frequented staff bathrooms that included HAPI takeaways, primarily focused on prevention (UW Health, 2020e). System-level evaluations included unit audits on PIP bundle compliance for at-risk patients and those with HAPI. These are currently completed manually by RISC nurses. An Adult PIP Interventions EHR build was in process for

easier audits on PIP compliance, but has since been postponed due to the COVID-19 pandemic and EHR prioritization needs. The pandemic has also halted weekly HAPI event reviews conducted by multidisciplinary stakeholders at the systems level (J. Monfre, personal communication, October 8, 2020). Currently, when a HAPI is documented the unit or population clinical nurse specialist initiatives an investigative assessment to identify potential causes, relevant prevention measures, and PIP bundle compliance (UW Health, 2020e).There have not been initiatives specifically targeted the organizational problem of DTIs and DST nor improvement of assessment and documentation of DST HAPIs.

Needs Assessment and Baseline Data

Over the last few years, UW Hospital HAPI trends have remained variable amidst organizational improvement efforts. Median HAPI percentages are as follows: June 2017: 1.79; June 2018: 1.95; November 2018: 3.01; June 2019: 2.94; June 2020: 2.57. The units with the highest incidence of HAPI were four adult intensive care units (UW Health, 2020a). In early 2018, the internal benchmark goal was HAPI median <3% monthly throughout the organization. In late 2018, an organizational goal was created that within three years, by December 2021, the organization would have a 0% HAPI rate eight of the 12 months of the year with an annual rate <1% (Johnson & Schmotzer, 2019). There is not a national HAPI benchmark, however NDNQI will provide unit means to compare organizational HAPI percentages to other like organizations. (J. Monfre, personal communication, October 8, 2020)

UW Health's Nursing Grand Rounds from November 2019, emphasized the concerning PI data found throughout the organization. The UW Hospital Quality Report from March 2019 to March 2020 exhibited persistent sub-optimal HAPI trends amidst recent quality improvement initiatives. This report identified that a median of 4% of patients had a HAPI. Of all UW

Hospital patients in this timeframe, a median of 3% had a Stage 2 or higher HAPI. Pressure injury prevention bundle compliance for at-risk patients was 67-81%, whereas the goal was 100%. Pressure injury bundle compliance for patients with a known HAPI was 41-95%, whereas the goal was 100% (UW Health, 2020a). Data since March 2020 has been limited by the current COVID-19 pandemic and three months without organizational audits. Of the six months inpatient audits were performed this year (January, February, March, May, August, and September), a total of 27 DTIs were identified throughout the organization. The monthly percentage of UW HAPIs that were DTIs varied from 7% to 36% with a mean of 15.66%, and a median of 13.5% (J. Montfre, personal communication, October 8, 2020; UW Health, 2020c).

As identified by the Wound, Ostomy, and Continence (WOC) Clinical Nurse Specialist (CNS), the organization struggles most with the appropriate assessment and documentation of DTI. DTIs present in all patient demographics and occur most often when patients are bed bound, have para or quadriplegia, or are found down prior to hospitalization. Of PIs, DTIs are the most commonly omitted or incorrectly documented in patients with DST, commonly on the ischial tuberosity, lower extremities, and heels (J. Monfre, personal communication, July 10, 2020). UW Hospital nurses often document DTIs in DST as "bruises" which delays assessment and interventions by consulted WOCN. DTIs often go unnoticed nor undocumented on DST until they "declare themselves" and open which is then staged a 3 or 4. DTIs are the greatest organizational priority due to worsened patient outcomes, quality metrics, and financial reimbursement for care (J. Monfre, personal communication, October 8, 2020). Organizational PI data is not reported by race, ethnicity, nor skin tone. There is a need for a further chart review for optimal needs assessment of PIs, specifically DTIs, among our adult patients with DST and a means for future audits that include DST (J. Monfre, personal communication, July 10, 2020).

Problem

Adult inpatients with darker skin tones at UW Hospital had under- and misdiagnosed deep tissue injuries that led to delayed treatment and wound healing with increased hospital length of stay, pain, morbidity, and overall healthcare costs.

Purpose Statement

The overarching project purpose was to decrease the pressure injury, specifically DTI, rates, severity, morbidity, mortality, and healthcare disparities among UW Health patients with dark skin tones. The specific aim of this project was to target the organizational and professional (nurse) factors that contribute to the complex relationship with direct patient outcomes. This goal was achieved through specific interventions related to organization tools and resources, buy-in and culture awareness, as well as nurse awareness, perception, and beliefs, training and education, resources and tools, and competencies as they relate to practice.

Synthesis of Evidence

A thorough literature review was completed to answer questions on how to assess, identify, and document PIs, specifically DTIs, in DST as well as to understand the disparities and barriers to caring for patients with DST with PIs. A search of Cinahl, Google Scholar, and PubMed databases was conducted using the search terms "BIPOC", "people of color", non-white", "minority", "dark", "black", "African Americ*", "DST", "pressure ulcer", "pressure injur*", "deep tissue injur*", "DTI", "wound", and "skin assess*". Results were filtered to include literature in the English language and the >18 years of age adult population. Remaining articles that applied to the population and problem of interest included a combination of retrospective data analyses (Bauer et al, 2016; Fogerty et al., 2008; Metersky et al., 2011; Seibert et al., 2020), descriptive studies (Redelings et al., 2005), double-blind peer reviews (Clark,

2010), cross-sectional studies (Shen et al., 2016), informational or commentary articles (Black et al., 2016; Black, 2018; Black & Simende, 2020), case reviews (Steven et al., 2015), multi-method collective case study (Oozageer Gunowa et al., 2020), and systematic literature reviews (Kačalov et al., 2019; Okoroh et al., 2017; Oozageer Gunowa et al., 2018; Scafide et al., 2020). Due to the limited amount of research specific to DST and PIs or DTIs, articles were not limited on publication date.

The following organizations have guidelines specific to HAPIs: American College of Physicians (ACP), European Pressure Ulcer Advisory Panel, National Pressure Injury Advisory Panel, and Pan Pacific Pressure Injury Alliance, and Wound Ostomy and Continence Nurses Society (WOCN). The guidelines offer strategies and recommendations related to pressure injury prevention, assessment, staging, and monitoring with documentation throughout all phases. Risk assessment should be completed through the use of a validated risk assessment tool and documented daily. All three guidelines found moderate quality of evidence supporting the sensitivity and specificity of the Braden scale to predict patients more at-risk for PI. Prevention interventions to minimize PI risk should be implemented and documented, including nutrition, repositioning, dressings, cleansers and creams, and mattresses. Skin inspection is to be performed as soon as possible but within eight hours of hospital admission, then daily by trained staff. Devices and dressings should be removed twice a day and documented. Devices that cannot be removed should be documented when repositioned (EPUAP et al., 2019; Qaseem, 2015; WOCN Society Wound Guidelines Task Force, 2017). A systematic review of the guidelines looked specifically at documentation recommendations and found documentation should include at minimum, location, size, base, exudate, surrounding area of PI with added

benefit from PI boundary, tunneling, sinuses, volume, margins, skin color, temperature, inflammation, odor, pain, and skin turgor (Kačalová et al., 2019).

The ACP 2015 guideline mentioned race twice: when it identified Black and Hispanic populations at higher risk of PIs, and when it noted one study that found no clear differences in risk assessment between Black and White patients when utilizing the Braden scale. The EPUAP et al. (2019) and WOCN guidelines provided recommendations specific to DST assessment and documentation. Further findings from the literature review offered more insight into the assessment skills and documentation needs specific to DST populations.

DST Assessment

Upon further review of the EPUAP et al. (2019) and WOCN guidelines and their references, several recommendations were identified specific to DST assessment. The NPIAP had a webinar recently that specifically discussed the assessment and staging of PIs in DST (NPIAP, 2020, May 21). The assessment and documentation characteristics should include visual inspection for erythema, discoloration, and a rating of coloration severity. Color changes may appear more blue, purple, or gray in color with a shiny or taut appearance. Providers have difficulty identifying pressure-related changes on visual inspection alone, as the naked eye cannot discern blanching nor discern a Stage 1 versus DTI (EPUAP et al., 2019; WOCN Society Wound Guidelines Task Force, 2017). Optimal visual assessment involved wetting the skin with water. Tactile characteristics were most likely to assist in DST assessments. This included palpating for induration often referred to as "bogginess" or "hardness" and temperature assessment without gloves, and general comparison to surrounding skin. Pain was a key symptom in PI assessment, especially in DST (Black et al., 2016; Clark, 2010; EPUAP et al., 2019; McCreath et al., 2016). A recent article by Black and Simende (2020) provided "ten top

tips" for clinicians during a skin assessment of a patient with DST. These included having a higher suspicion for PI in DST, optimal lighting, skin color changes, use of an objective color chart, moistened skin, prioritized palpation, appearance of DTI on DST, use of sub-epidermal moisture measurement, superficial wounds and blisters, and pigmentation changes of healing wounds.

DST DTI Staging

Throughout the literature and guidelines, the staging and documentation of PIs was uniform and referenced the NPIAP Pressure Injury Staging System which defined a DTI as "intact or nonintact skin with localized area of persistent nonblanchable deep red, maroon, purple discoloration, or epidermal separation revealing a dark wound bed or blood-filled blister. Pain and temperature change often precede skin color changes. Discoloration may appear differently in darkly pigmented skin" (Edsburg et al., 2016). Once a PI is identified, continued monitoring and documentation should occur. It was recommended DTI evolution be documented through evaluation of underlying injury: sloughing of epidermis, reveal of deeper injury such as full thickness, and the stage of any resultant injury (EPUAP et al., 2019). There were no current guideline recommendations for the evolution of DTI in DST (NPIAP, 2020, May 21).

DST Documentation

Patients with DST with PI Stages 2, 3, or 4 should have documented skin sensitivity, temperature, changes in consistency, and pain (EPUAP et al., 2019; Kačalová et al., 2019). Skin tone was more predictive of skin damage on the trunk than ethnicity or race and those with documented DST had more severe levels of skin damage. Skin tone or pigment scales aided in the assessment of differences in DST (McCreath et al., 2016). The field of dermatology has validated the use of the Munsell Color Theory as an objective assessment of all skin tones via

hue, value, and chrome. The use of the Munsell Color Chart as an objective measure for early and aggressive prevention has shown increasing sensitivity of DST PI risk assessment for practice and research (McCreath et al., 2016; Bates-Jensen et al., 2017).

Novel Assessment Technologies

There were promising technologies identified for DST assessments and earlier identification of tissue injury include thermography, high resolution ultrasound or laser doppler, and sub-epidermal moisture (SEM). However, the literature remained inconclusive, guideline recommendations varied, and all lacked implementation guidelines. A continued need was identified for objective measurement tools for early identification of skin damage (EPUAP et al., 2019; WOCN Society Wound Guidelines Task Force, 2017). A recent systematic review of 18 studies evaluated the role of bedside ultrasound, thermography, SEM measurement, reflectance spectrometry, and laser doppler flowmetry in earlier detection of PI. DTIs were directly assessed in only four of the studies. SEM measurement had the highest quality research and resulted in early identification of Stage 1 PIs. SEM measurements and spectroscopy potentially improved the identification of pressure-related erythema in patients with DST and offered clinical utility, but remained costly and had implementation barriers including bedside nursing time, education, and equipment portability and accessibility (Scafide et al., 2020).

Research Gaps

Similar to international PI guidelines, there has been little mention of DST in medical research. The racial and ethnic underrepresentation in research was attributed to study recruitment, minorities' disinterest or distrust, and lack of access (Buster et al., 2012). Healthcare disparity research has been limited, and what has been conducted related to DST has primarily been specific to dermatology. This included noted disparities among DST and skin cancer, atopic

dermatitis, and the limited training and perception of inexperience of U.S. medical students (Buster et al., 2012). The research on PI development and management has not addressed needs specific to DST. Current literature has just began to address research gaps in skin tone variance in skin assessments and PIs and recognizes that ethnicity cannot be used in place of skin tone (Cowan et al., 2018, November 14; Gostelow, et al., 2018; McCreath et al., 2016; Mukwende et al., 2020). There was an identified need for future research on DST PI assessment and risk tools and for future methods and instruments for pigmentation assessments to close the disparity gap (Cowan et al., 2018, November 14; EPUAP et al., 2019; Lyder, 2009; McCreath et al., 2016; Oozageer Gunowa et al., 2018).

Limited Healthcare Provider Education

A prominent theme throughout the literature and guidelines was the impact of poor staff recognition, inadequate assessment, and incorrect staging on the overall quality of the reported HAPI data, especially among patients with DST (Agency for Healthcare Research and Quality, 2014; NPIAP, 2020, May 21). There has been a long history of healthcare curriculum that omits images of black and brown skin conditions, and diverse language and descriptors that are inclusive of DST. The lack of DST in provider education delays diagnosis and misdiagnosis of DST skin and wounds (Gostelow, et al., 2018). A recent educational handbook entitled *Mind the Gap* was created by medical students to offer pictures and descriptions specific to DST skin and wounds (Mukwende et al., 2020). The first study to evaluate undergraduate nursing education and teaching materials related to PI healthcare disparities found all five higher education institutes evaluated focused PI education around Caucasian skin tones and contained "brief, separate, and superficial" information on PI among patients with DST (Oozageer Gunowa et al., 2020). The recent NPIAP webinar was the first national organization to have a presentation

specifically regarding the assessment and staging of PIs in DST with photos and descriptions (NPIAP, 2020, May 21). Researchers have attempted to close this health disparity through provider education. A study found that education, real-time feedback, and staff financial incentives were effective in improving DST PI awareness and accuracy and ultimately reducing the overall PI rates in both Black and White nursing home residents (Rosen et al., 2006). It was thought this approach may also improve patient care in other healthcare settings (Lyder, 2009). There had not been research studies that evaluated the efficacy of nurse education and competence on PIs and DST in an acute care setting (Oozageer Gunowa et al., 2018). Current guidelines articulated the need for further research on effective strategies for health professional education focused on PI risk and prevention (EPUAP et al., 2019).

Conceptual and Quality Improvement Frameworks

The Natural History of Disease and Levels of Prevention (Clark, 1954) was a conceptual framework used to explore the levels of preventive measures and to design interventions to avoid worsened patient outcomes (Clark, 1954). As visualized in Appendix B, early identification and documentation of DTIs in DST reflected the level of prevention focused on preventing sequelae and shortening any disabilities such as progressive tissue damage. The project implemented nurse education and resources specific to DTIs in DST which prioritized the early diagnosis and prompt treatment of DST in an effort to prevent further complications and ensure effective, equitable care. As health promotion strategies to avoid pressure injuries were uniform between skin tones, races, and ethnicities and research had yet to identify specific protections against DTIs in DSTs, the intervention plan was aimed at improving early and correct identification of skin alterations and PIs, specifically DTIs, in DST for prompt therapeutic intervention.

The Systems Engineering Initiative for Patient Safety (SEIPS) Model 2.0 was the healthcare human factors framework utilized for its core principles of systems orientation, person-centeredness, and design-driven improvements. As shown in Appendix C, the sociotechnical work system model produced work processes which ultimately shaped outcomes in an integrative manner with constant adaptation (Holden et al., 2013). This framework was used to understand provider behaviors within the context of staff knowledge and competencies related to DTIs in DST. This framework also provided a lens to understand the relationship of nurse professionals, assessment tools, and EHR documentation and ways in which these support or inhibit translating evidence into practice to identify short, medium, and long-term project aims. The SEIPS Model 2.0 was used in the creation of the project action items targeted towards work system components as well as to categorize and thematically analyze project results as professional (nurse) and organizational outcomes.

Project Aims

Short, medium, and long-term aims were developed to meet the overarching project purpose. This project targeted short-term aims with organizational and professional outcomes in alignment with the overarching project purpose. The short-term, or project, aims included the following:

- Improve nurse awareness, knowledge, and perceptions of the assessment and documentation needs of patients with DST, specifically related to PIs
- Create and implement educational resources related to the skin assessment and documentation of patients with DST
- Systematically guide practice and improve documentation through the addition of inclusive, evidence-based terminology and tools in the EHR

- Create a way to stratify wound data by skin tone for a deeper analysis and awareness of patient populations most at risk for health care disparities
- Build interdisciplinary relationships and promote buy-in throughout the organization to facilitate and sustain organizational initiatives to improve the skin and wound needs of UW Health patients with DST

Medium- and long-term project aims are discussed in the Sustainability section below.

Action Steps and Strategies

The SEIPS Model 2.0 Work Systems components of person, tools and technology, tasks, internal environment, and organization provided a framework to guide the initial fishbone diagram that explored the upstream causes that led to the overarching problem of under- and misdiagnosed DTIs among UW Health adult inpatients with DST that result in poor outcomes. Similar to the SEIPS Model 2.0 Work Systems concepts, "people" and "documentation" offered the most opportunities for intervention. "People" highlighted the unique roles of bedside, RISC, and WOCN nurses while also the variable background education and training nurses receive, internal biases or fears, as well as assessment practices in alignment with guideline recommendations related to the skin assessment of patients with DST. Because of the unique role as unit-based resource nurses throughout the organization, self-motivated interest in wound and skin content, awareness of organizational resources, and accessibility with regular meeting times, the RISC nurses were initially planned as the intervention group. An electronic needs assessment survey was sent to all RISC nurses to formulate educational content.

Due to organizational COVID restrictions, RISC nurse meetings were canceled throughout Spring 2021, which required education to be delivered electronically and pre-recorded. In an effort to increase nurse involvement and organizational project scope, the target

intervention population expanded to include the organizational RISC nurses along with ICU nurses on the four units with the highest incidence of PIs, referred to as Units A, B, C, and D for confidentiality.

The fishbone activity also highlighted the "documentation" components that resulted in poor patient outcomes related to PIs in DST. Specific documentation shortcomings included the lack of an area that prompts or allows a provider to document an objective skin tone as well as current selectable nursing documentation terms that do not align with guideline recommended terminology for all skin tones. The lack of documentation terms available and monthly PI adult processes that do not stratify PIs by skin tone may limit the quality of reported PI data and overall do not provide a clear understanding of the patient populations and patterns of PIs among adult inpatients at UWH. Further project interventions focused on aligning nurse documentation with guideline recommendations to promote a more culturally congruent, inclusive environment at the organizational level.

With respect to the short-term aims, specific project action items and steps were strategically taken to align with the overarching project purpose. To improve nurse awareness, knowledge, and perceptions of the assessment and documentation needs of patients with DST and create novel educational resources for the organization, a video and resource sheet were developed. To systematically guide practice and improve nurse documentation, efforts were made to align the upcoming Wound Lines/Drains/Airway (LDA) and current nursing assessment flowsheet terminology to the guideline recommended terms and inclusive DST language. To create a way for wound data to be stratified by skin tone for a deeper analysis and awareness of potential organizational outcome disparities, efforts were made for organizational adoption of an objective skin tone assessment tool, the Munsell Color Chart 5YR, to be added to the EHR. To

build interpersonal relationships and promote organizational buy-in to facilitate and sustain organizational initiatives, practice change, and culture, numerous UWH leaders and groups were actively involved in elements of the project. The NPIAP guideline recommendations were aligned with the SEIPS work system components to identify project action items, as depicted in Appendix D. The specific action items and steps taken were related to the SEIPS 2.0 Model and project aims as depicted in Appendix E.

Educational Resources

The nurse needs assessment surveys were completed by 19 RISC nurses, and one ICU unit council. The following content needs were identified and used to create the project educational materials: Early identification of PI; Staging of PI; Blanching; Erythema or color changes; Documentation terminology descriptions; and Visual examples.

Video. A five minute video was created in which the project lead modeled a thorough skin assessment on a model patient with DST. The video included the above content as requested by RISC and unit council nurses. It also emphasized guideline recommended assessment techniques, documentation terms, and DTI specific identification on DST. Video recording equipment was obtained through the University of Wisconsin library rental services. The School of Nursing building and faculty were utilized for filming. The model patient was a voluntary peer. The video was shared with a private link ensuring viewing was restricted to those with the web address.

Resource Sheet. A written resource sheet was created for the skin assessment and documentation of patients with DST. See Appendix F to view the resource sheet. It discussed the literature recommendations, application, benefits and harms, and the action items for organization nurses. It provided written directions outlining the steps to thorough assessment and

documentation of DST, along with organizational and supplemental resources. This resource sheet modeled the current Translating Research Into Practice (TRIP) sheet format and was created with the assistance of the organization evidence-based practice (EBP) CNS.

Documentation

Additional Documentation Terms. A thorough review of the PI literature, organizational PI presentation by Johnson & Schmotzer (November 19, 2019), and top PI guidelines from the EPUAP (2019), ACP (2015), and WOCN (2016), a list of 33 skin and PI documentation characteristics and terms were compiled. The International EPUAP et al. (2019) PI guideline recommendations were organizationally preferred by the WOC CNS and physically provided to the project lead. The identified characteristics and terms were compared to current UWH nursing documentation available terms in the Adult Health Assessment and Wound flowsheets as well as the upcoming Wound LDA anticipated documentation. The adult health assessment flowsheet allowed nurses to document skin alterations that were not within defined limits of normal as previously determined by the organization's Nursing Practice Council (NPC) and NDC, and Quality department. The Wound LDA flowsheet was the location where established and identified wounds were documented. Access to the current documentation flowsheet available terms and functionality was obtained from NDC and NI leaders. These two documentation areas were chosen to compare and propose documentation terms as they were the current process and location for nursing documentation related to skin and wounds. Of the 33 characteristics and terms recommended by the literature and guidelines, 23 were available in current documentation with 10 terms missing. The project lead categorized the 10 missing terms by the form of assessment (tactile, visual), changes in (temperature, texture, sensation, discoloration, consistency), and referred to the specific EPUAP et al. (2019) guideline

recommendations. The additional terms and specific literature recommendations for the nursing assessment and documentation can be viewed in Appendix G.

Munsell Color Chart 5YR. The EPUAP et al. (2019) guideline recommended to "evaluate the relevance of performing an objective assessment of skin tone using a color chart" and specifically discussed the Munsell Color Chart for its significant predictive value of stage 1 PIs, interrater and intrarater reliability among skin tone classifications, especially in DST. The field of dermatology has validated the use of the Munsell Color Theory as an objective assessment of all skin tones via hue, value, and chrome. The Munsell Color Chart offered an objective measure for early and aggressive prevention with evidence of sensitivity of DST PI risk assessment for practice and research (McCreath et al., 2016). For these reasons, the adapted Munsell Color Chart 5YR was chosen as the objective skin assessment tool for this project. An internal organizational ServiceNow Ticket was utilized for the communication and approval process for the Munsell Color Chart tool.

Organizational Outreach

There were numerous organizational leaders and groups that were sought out and consulted throughout the project. With the nature of the project aim related to decreasing PI in patients with DST, the project sponsor was strategically identified as the WOC CNS for their content expertise, familiarity with organizational culture and EBP implementation, as well as their oversight of the WOCN and RISC nurses. After their departure from the organization, the project sponsor was the RISC CNS lead and the content expert a WOCN, as identified by the WOC manager. The unit-based CNS groups were utilized for the dissemination of project education materials and surveys due to their access to up to date staff nurse lists, frequency of communication with their unit nurses in-person during huddles and electronically through

emailed weekly updates, and their organizational awareness and commitment to quality improvement projects.

The project lead consulted Nursing Informatics (NI), Nursing Documentation Committee (NDC), EBP CNS, Survey Subcommittee, and the Center for Clinical Knowledge Management (CCKM) for their approval authority throughout several components of the project. The EBP CNS was frequently consulted for their various roles and oversight of the Survey Subcommittee, organizational Research and EBP projects, and TRIP Sheets. The DEI, specifically the Chief Diversity Officer, was involved to assist in organizational networking and support for project adoption and expedition of project approvals, specifically with their relationship with CCKM. Organizational outreach and communication was typically done electronically through email and the organization's WebEx video meeting platform, due to the organization's meeting policy in the current pandemic. One-on-one in-person meetings occurred with the WOC CNS and WOCN content expert three times throughout the project planning and intervention phases for content approval and intervention clarity.

Protection of Human Subjects

The University of Wisconsin-Madison Quality Improvement/Program Evaluation Self-Certification Tool was completed on September 21, 2020. This project was deemed a quality improvement and/or program evaluation and did not require institutional review board approval. There was no collection of patient or provider information. UWH nurse pre- and post-surveys were anonymous and results only accessible to the project lead via SurveyMonkey and Qualtrics password protection. The patient model used for the video recording modeling a skin assessment on a patient with DST provided written consent for the recording and sharing of video content within UW Health and the University of Wisconsin School of Nursing for educational purposes.

Their identity has not been disclosed outside of School of Nursing project faculty.

Outcomes and Evaluation Methods

Project outcomes were identified and categorized as organizational and professional outcomes in alignment with the overarching project purpose, action items, and in reference to the SEIPS 2.0 Model. Action item outcomes were individually evaluated by their status as "approved", "implemented", and/or "evaluated" and with respect to the action steps completed.

Organizational Outcomes

Organizational outcomes included tools, resources and training; as well as culture awareness and buy-in. Tools, resources, and training were evaluated by the organizational adoption of EHR documentation terminology in alignment with guideline recommendations, an objective skin tone assessment tool, and education materials regarding the skin assessment and documentation needs of patients with dark skin tones. Culture awareness and buy-in were evaluated by the project outreach, stakeholders, organizational decisions for adoption of culturally congruent materials and processes, as well as the support from organizational leaders and groups committed to take ownership for project component next steps. Both outcomes were further evaluated by the use of pre- and post-surveys administered to the RISC and ICU nurses and field notes.

Professional Outcomes

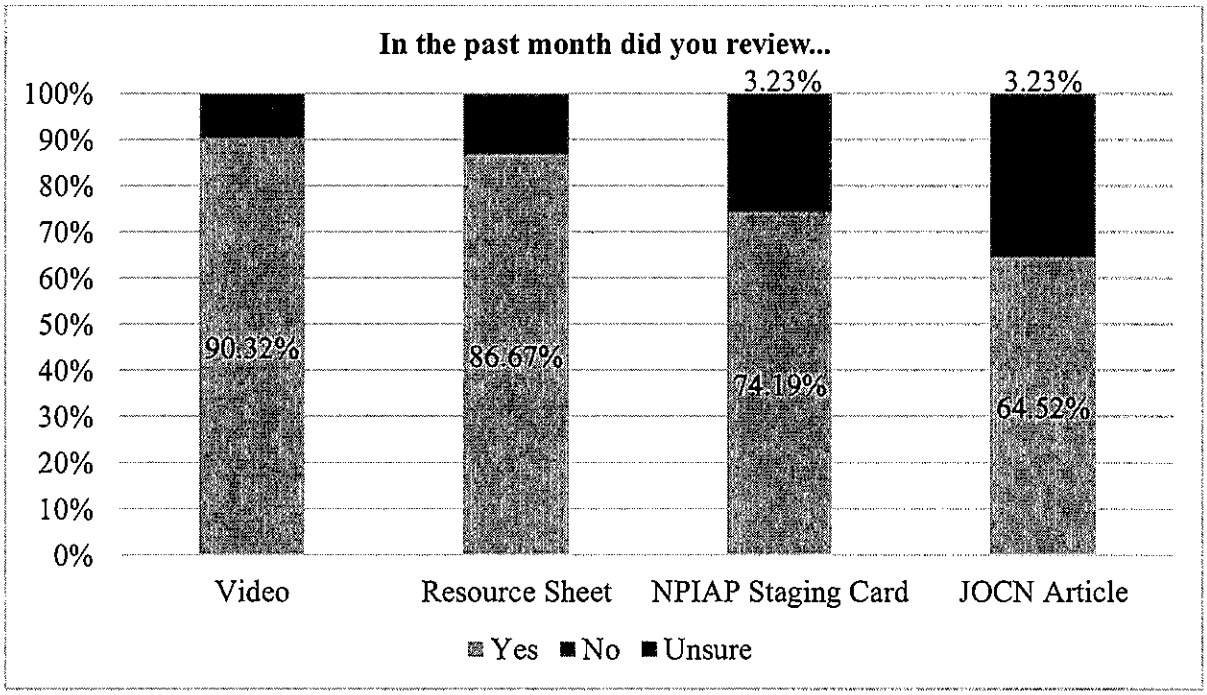
Professional, specifically nurse, outcomes included awareness, perceptions, and beliefs; training and education; resources and tools; and competencies. Competencies encompass the increased and perceived knowledge and the translation to practice. Specific outcomes included nurse reported review of education materials, completion rates of pre- and post-surveys, and reported satisfaction and feedback of the education material content. These professional

outcomes were evaluated by pre- and post-surveys administered to the RISC and ICU nurses with supplemental field notes. The surveys were approved by the UWH Survey Subcommittee prior to their dissemination. Surveys were built, distributed, and results collected utilizing the UW Madison Qualtrics Survey account. Survey responses remained anonymous. The pre-surveys were disseminated via unit-based CNS emails to the included ICU and RISC nurses along with the education video link, resource sheet, NPIAP Staging Card, and Journal of Clinical Nursing (JOCN) review article (NPIAP, 2020; Oozageer Gunowa et al., 2018). Pre-survey results were collected over two weeks. At that time, another email was distributed to ICU and RISC RNs via the CNSs that included the educational resources along with a post-survey. Post-survey results were collected over two weeks, then extended another three days with email reminders to encourage participation in an effort for improved response rates. The surveys were analyzed utilizing both quantitative and qualitative methods along with supplemental thematic analysis from field notes. Reference Appendix H to view pre- and post-surveys. Field note data was obtained from guided conversations that utilized the pre- and post-survey questions as prompts and was collected during the two weeks the post-surveys were live.

Project Outcomes and Findings

Pre- and post-surveys were emailed to all 58 RISC nurses throughout the organization and 268 nurses from the included ICU units. Five nurses overlapped as both RISC and ICU nurses, therefore a total sample of 321 nurses were invited to participate in the project. The pre-surveys had 70 responses of which two were blank and subsequently excluded, resulting in a total of 68 responses for a response rate of 21.18%. Of respondents, 26.47% were RISC nurses, 66.18% were from the included ICUs, and 7.35% were both adult ICU and RISC nurses. The RISC nurse pre-survey response rate was 39.65% and ICU nurse 18.65%. Response rates by ICU

were the following: Unit A 10.0%, Unit B 0.50%, Unit C 48.27%, and Unit D 25.0%. The post-surveys had 31 responses for a response rate of 9.65%. Of respondents, 29.03% were RISC nurses, 64.52% were from the included ICUs, and 6.45% were both adult ICU and RISC nurses. The RISC nurse post-survey response rate was 18.97% and ICU nurse 8.20%. Response rates by ICU were the following: Unit A 2.85%, Unit B 2.90%, Unit C 41.37%, and Unit D 6.0%. Field note data was collected from six nurses from Unit C. The ICU and RISC nurse self-reported review rates of the educational materials were as follows:



Action Item Outcomes

The five project action items were completed with varying progress by the end of the project. A video that demonstrated the assessment and documentation of a patient with DST was created, approved by a WOCN and project sponsor, disseminated to the project intervention population of RISC and ICU nurses and evaluated through surveys and field notes. An electronic, written resource sheet was created that discussed the problem, literature and guideline

recommendations, implications for practice, and available resources regarding the assessment and documentation needs of patients with DST. This resource sheet was created, approved by a WOCN, EBP CNS, and project sponsor prior to project dissemination, and evaluated by surveys and field notes.

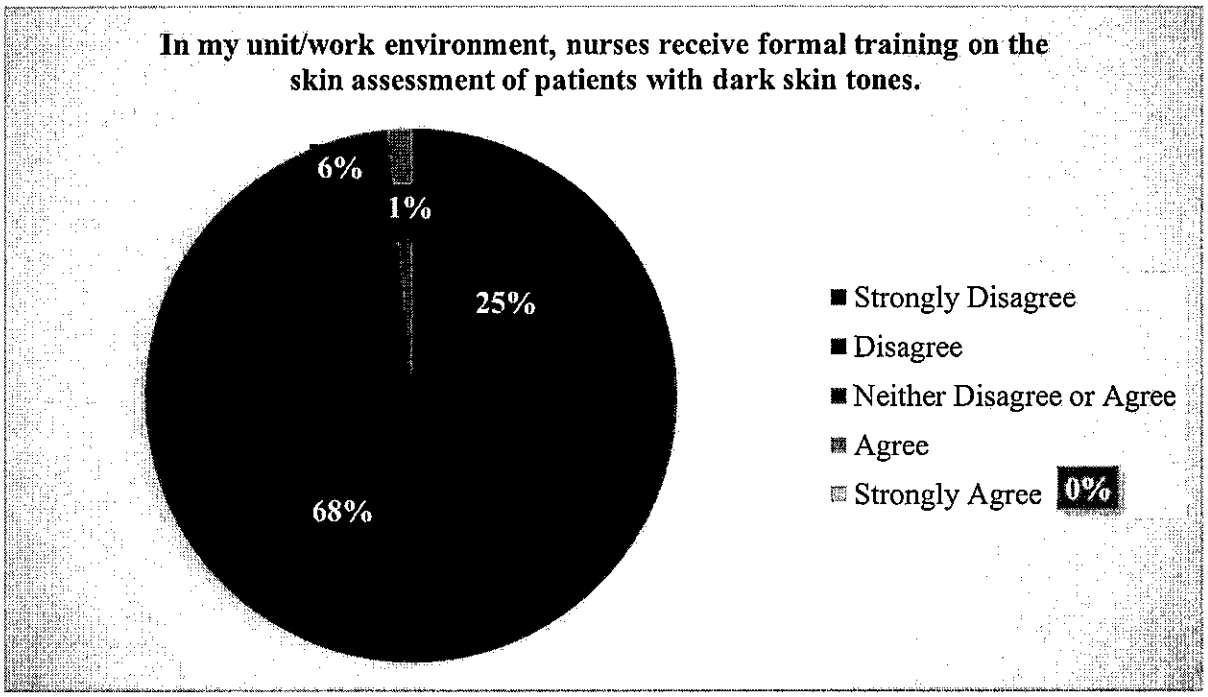
A thorough review of the literature and PI guidelines was conducted and 10 skin alteration terms inclusive of dark skin tones were identified as missing in UWH EHR nursing documentation. These 10 identified terms were approved by WOCN content expert, pitched to NDC and NI, approved for organizational adoption, drafted, and currently in the build mode by the organization's EHR team. The terms will also be included in the upcoming Wound LDA documentation that has an undetermined go-live date, but will function as the documentation location for wound tracking and is accessible to both inpatient and outpatient care settings and providers. An adaptation of the Munsell Color Chart 5YR was constructed with a proposed EHR documentation location. The organizational adoption of the Munsell Color Chart tool was approved by the WOCN content expert and CCKM. The UW CCKM evaluated and approved the clinical reference tool, confirming validity, reliability, and the use within copyright and fiscal terms.

Finally, organizational leaders and groups throughout UWH were actively engaged and included throughout the project in an effort to solicit buy-in for further organizational commitment to sustainable practice and culture change to meet the needs of providers and diverse patient populations. Key stakeholders committed to the future of this project included the WOC department, Research and EBP CNS, unit-based CNS group, NI, NDC, DEI, and Inclusion, CCKM, Survey Subcommittee, and the Nursing Research and EBP Council. The full

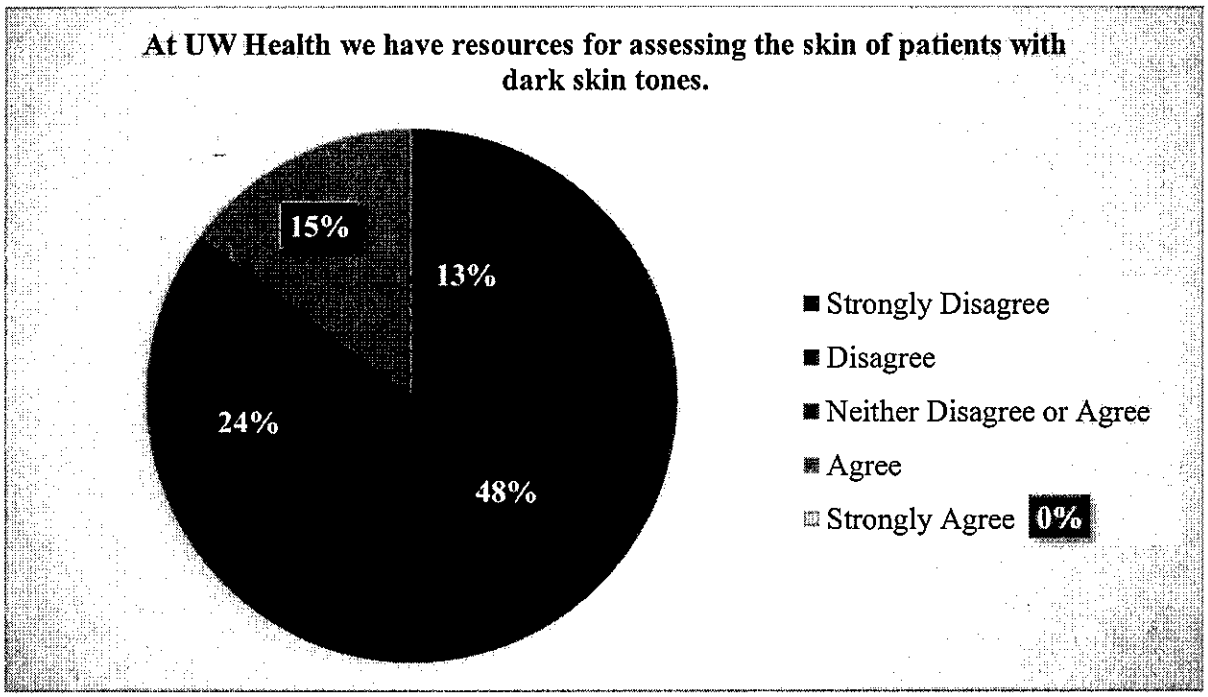
list of project stakeholders are listed in Appendix E under organizational steps taken. Reference Appendix I to review the action item progress as related to the project outcomes.

Organizational Outcomes

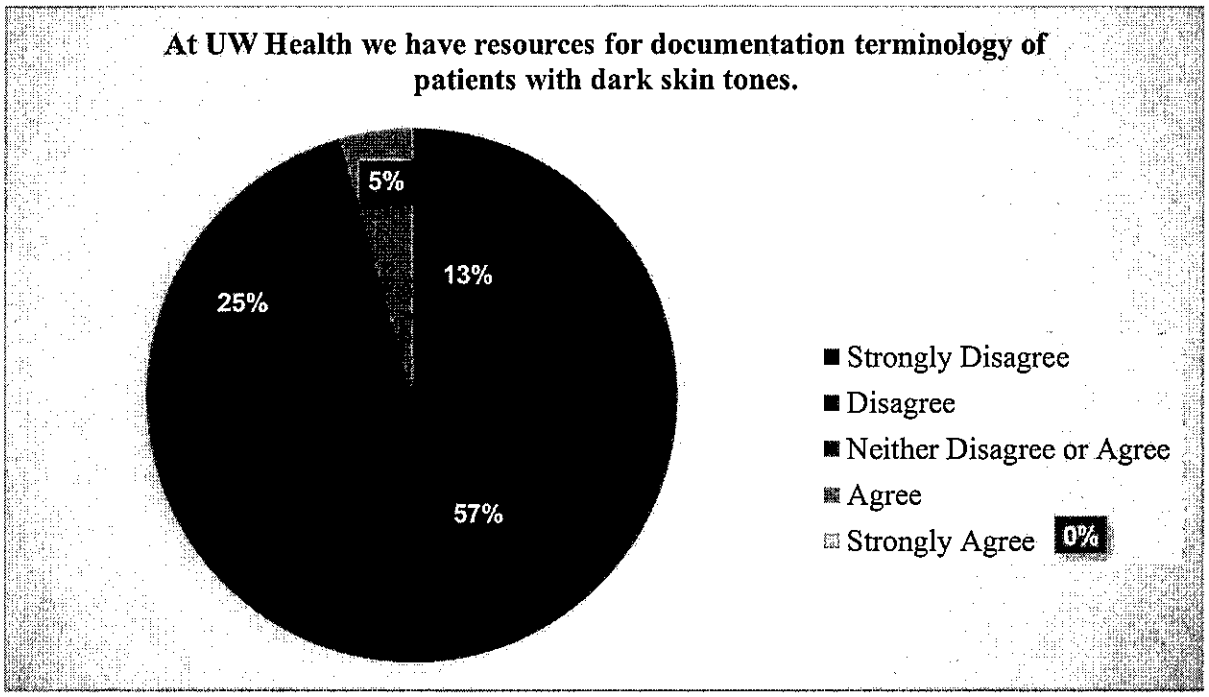
Tools, Resources, and Training. The organizational approval, adoption, and build of the additional 10 documentation terms within the EHR nursing documentation successfully aligned with guideline and literature recommendations for inclusive care of diverse patient populations. The CCKM approval for the organizational adoption of the Munsell Color Chart 5YR further aligned with guideline recommendations for PI risk assessments, specific to patients with DST. The successful creation, approval, and dissemination of education materials regarding the skin assessment and documentation needs of patients with DST met guideline recommendations and offered organizational resources for bedside providers that previously did not exist. The survey questions below evaluated current organizational tools, resources, and training and were supplemented with field note findings. See Appendix J for raw data values. The inserted graphs rounded data to the nearest whole number percentage for better visualization.



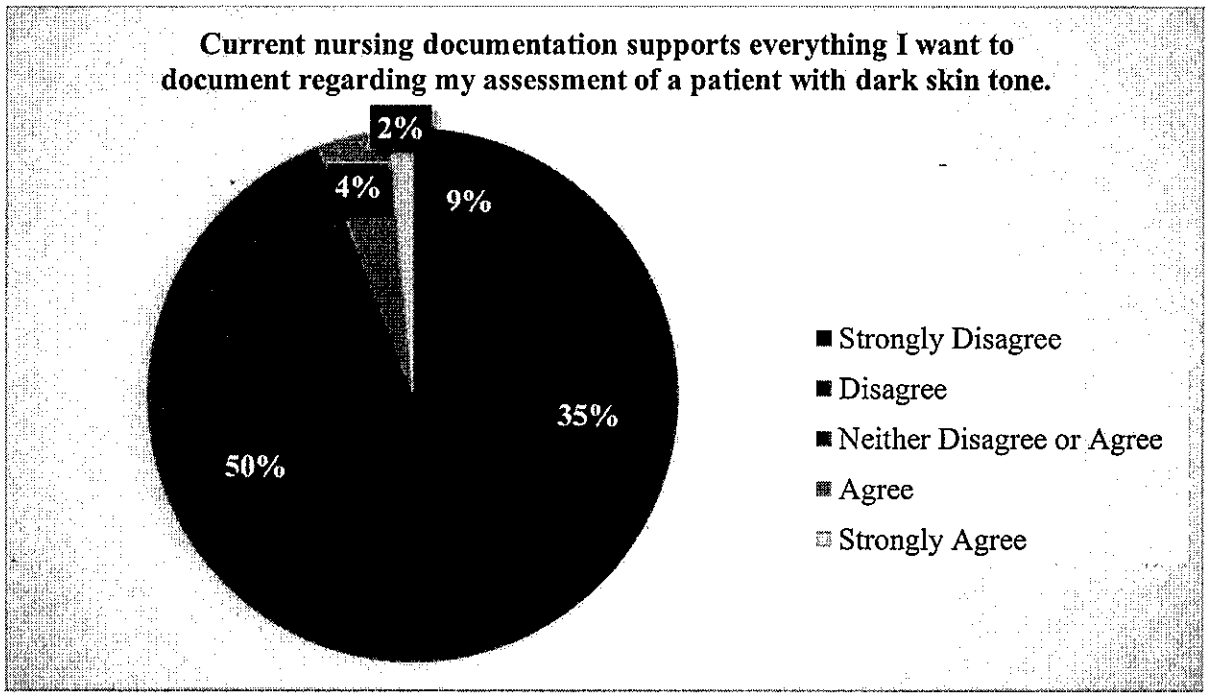
Field notes revealed all six individuals from Unit C had no formal UWH training on the skin assessment of patients with DST. Three nurses shared that any education had focused on white or Caucasian patients and focused on staging PIs. Two individuals shared a similar lack of education or training at other healthcare employers in the Midwest. According to one RISC RN, "all education has been the same as white/light skin" and RISC RN case studies "never included DST because it's hard to see evolving wounds in DST, especially not stage 2 or lower."



Field note findings correlated with the survey results above. All six individuals denied knowing of organizational educational resources for assessing the skin of patients with DST. They all reported educational resources on the Wound and Skin intranet page that focused on light skin tones along with PI prevention, staging, and treatment dressings.



Field note findings correlated with the survey results above. All six individuals discussed a lack of educational resources specific to documentation terminology for DST. One individual stated "I knew there were differences in DST, but didn't know all the colors." A RISC RN stated that "being with the WOCN was the first time I learned the terms boggy, shiny, taut, blue, and purple." A respondent identified a current barrier was that there were "so many spots for different things" related to EHR documentation.



Of the 13 free-text responses to the pre-survey prompt "why or why not?", five recognized they needed more knowledge or education and three respondents discussed limitations of current documentation including the prioritization of blanching, charting by exception practices that limit descriptions of "nuanced situations", and skin color not being reflective of how PIs present on DST. Two mentioned a need for culturally appropriate vocabulary. One response recognized a need for terminology definitions within the EHR and another that there was "no specific documentation tool to differentiate." One respondent stated there were "plenty of options for adding notes on observations."

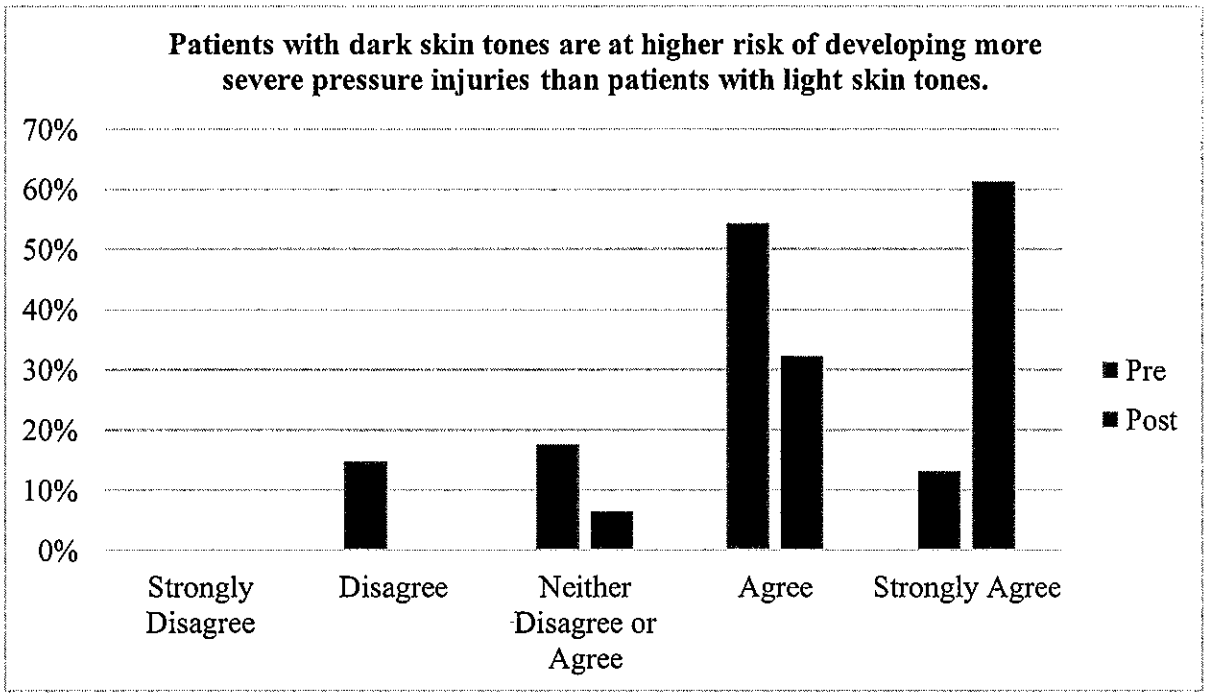
Culture Awareness and Buy-In. The project outreach, stakeholder involvement, and organizational leaders and groups involved and committed to take ownership for project components demonstrated successful awareness and buy-in at the organizational level. Specifically, the increased cultural awareness and commitment for future project aims among the CNS group, WOCN, DEI, DI, NDC, and the Research and EBP CNS exemplifies a profound

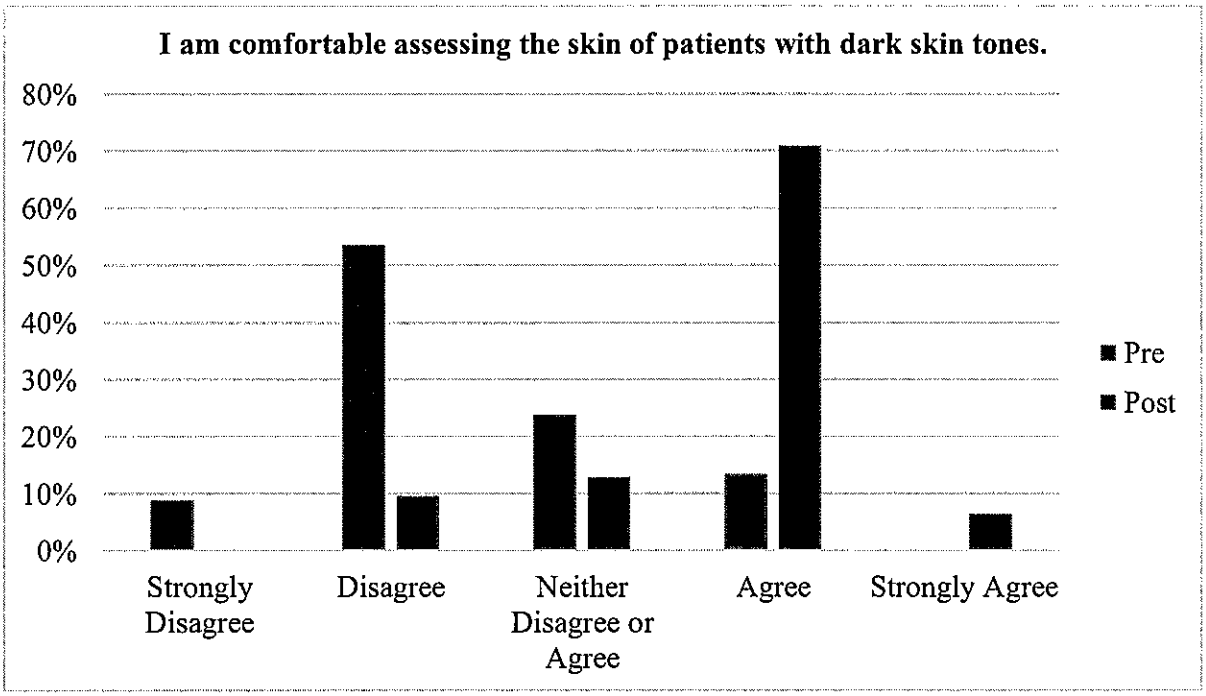
project impact. The extent of success can be visualized through the action steps taken in Appendix E and action item progress in Appendix I. The organizational buy-in has been remarkably high as evidenced by organizational approval and adoption of culturally congruent resources, processes, documentation, and tools and the interest expressed from affiliate facilities to adopt similar interventions, as discussed in the Sustainability section below.

Professional Outcomes

Professional outcomes were evaluated through the following survey questions with qualitative thematic analysis of free text survey questions and supplemented with field notes. See Appendix J for the raw quantitative survey data.

Awareness, Perceptions, and Beliefs. The following survey questions were used to evaluate changes in RISC and ICU nurse awareness, perceptions, and beliefs related to the healthcare disparities of PI in DST and perceived comfort and confidence in their assessment and documentation.

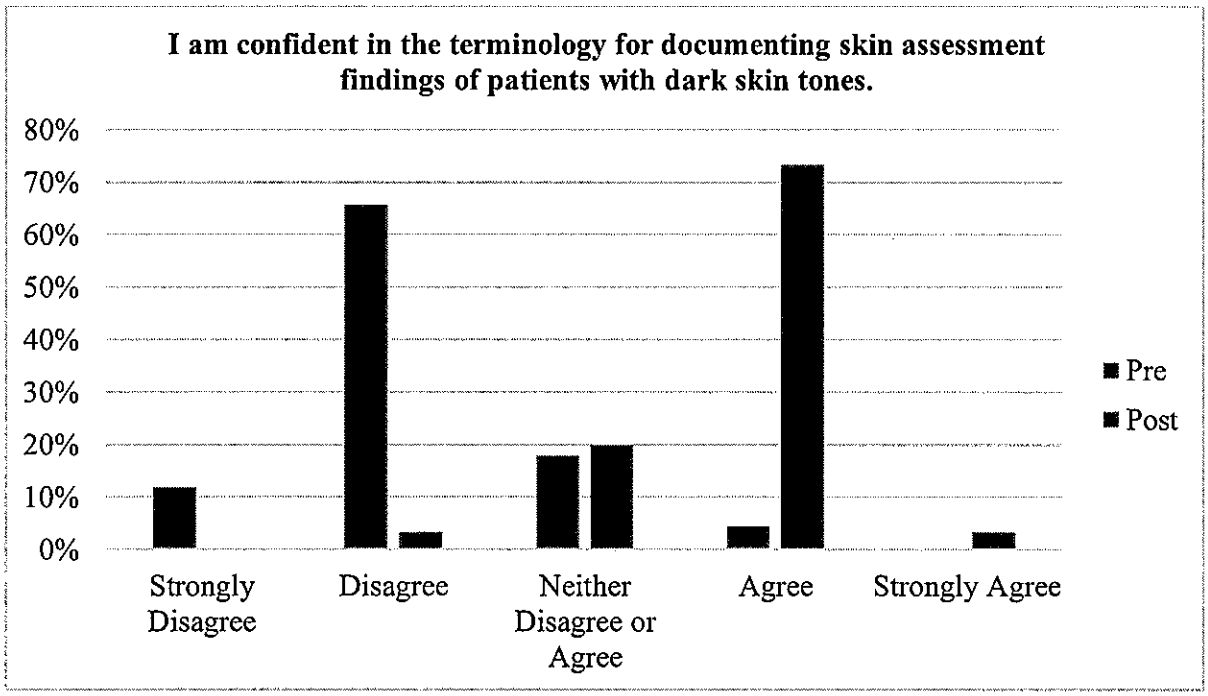




Of the 24 free-text responses to "why or why not?" in the pre-survey, 18 reported they had not received enough education or training. This was expanded upon with three responses related to prior education on light skin tones and a lack of DST examples, two responses discussed unawareness of how Stage 1 PI on DST look and the preparedness to assess skin tones that show redness. One respondent mentioned "I don't know the language" and another stated they "could always use more info." Of the 24 free-text responses, four reported unfamiliarity or a lack of experience and exposure to patients with DST. Two respondents expressed comfort in their assessment skills stating "I feel like I know what to look for and when to assess further" and "to identify any sort of skin issue on dark skin tones" and attributed this to "after seeking a pressure injury on an individual with a dark skin tone, I have gone off that to identify other people."

Of the 15 free-text responses to "why or why not?" in the post-survey, five respondents mentioned the video resource positively as "very helpful", "informational", and offered "great

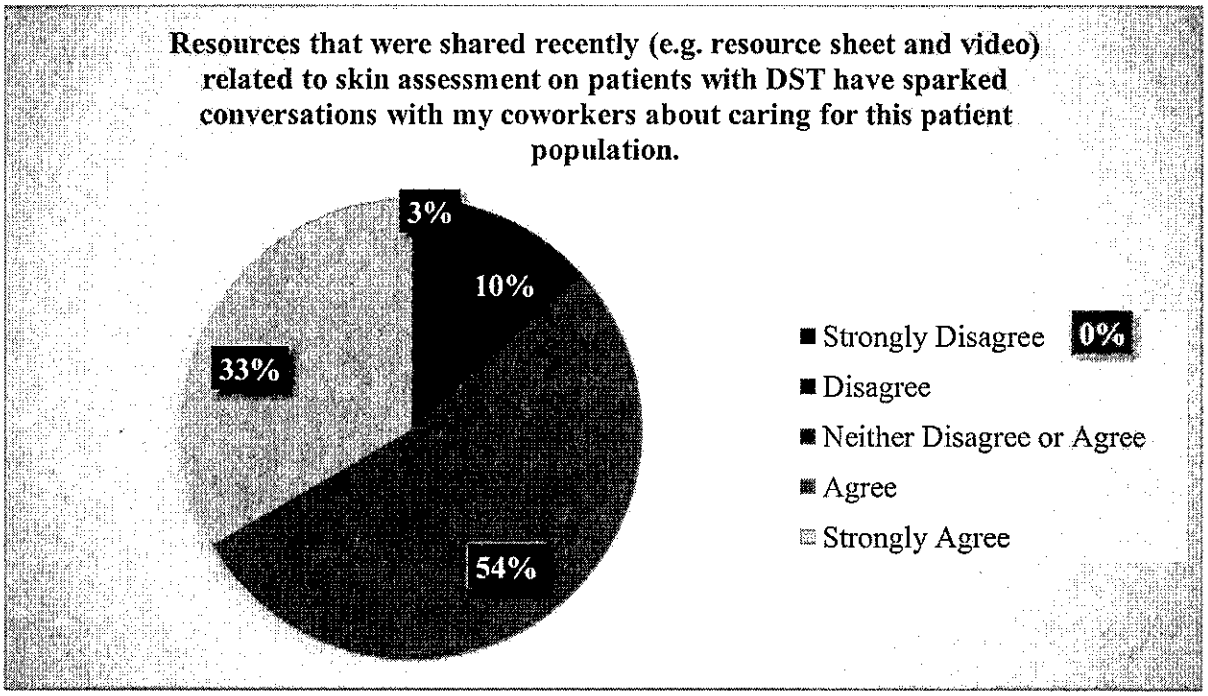
assessment techniques". Two responses identified a continued need for more education and two elaborated further that there was a need for "more in-person practice and "real patient" experiences. One response identified the "visual resources" as helpful and another specifically mentioned the "reading materials". One response stated they would add "pain and more detailed palpation to my skin assessment with patients who have DST". Two respondents who disagreed with the survey question and lacked comfort in their assessment attributed this to a lack of experience with patients with DST.



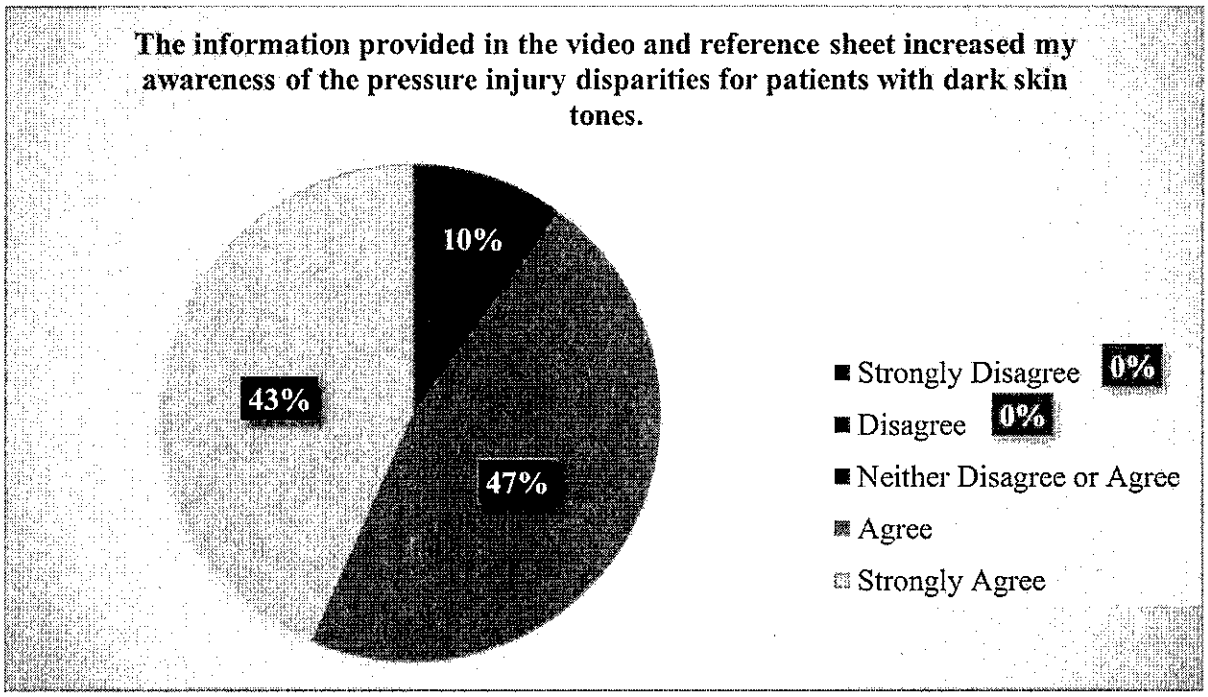
Of the 19 free-text responses to "why or why not?" on the pre-survey, 17 discussed the lack of education or training, of which one elaborated "we have been taught in a light skin tone focused way", another stated they were "unaware of proper terminology", and another "I feel like by the time staff realizes an injury may exist the patient already has a DTI or Stage 2 or greater." One response attributed the lack of education to cancelled RISC meetings. One

response discussed their documentation practices with "I use the options provided by [the EHR], but I'm not sure if these choices are appropriate for all skin tones."

Of the 11 free-text responses to "why or why not?" on the post-survey, nine agreed they felt more confident with three who attributed it to "the resources" provided, one specifically stated the video as "very helpful in providing descriptors" and another attributed their increased confidence to "reading the resource sheet, watching the video and staging card." Five responses mentioned descriptors or descriptions and terminology found in the educational resources as reasons for their agreement with the survey question. Two responses disagreed with the survey question and attributed their lack of confidence with a need for further education and another with further experiences with patients with DST.

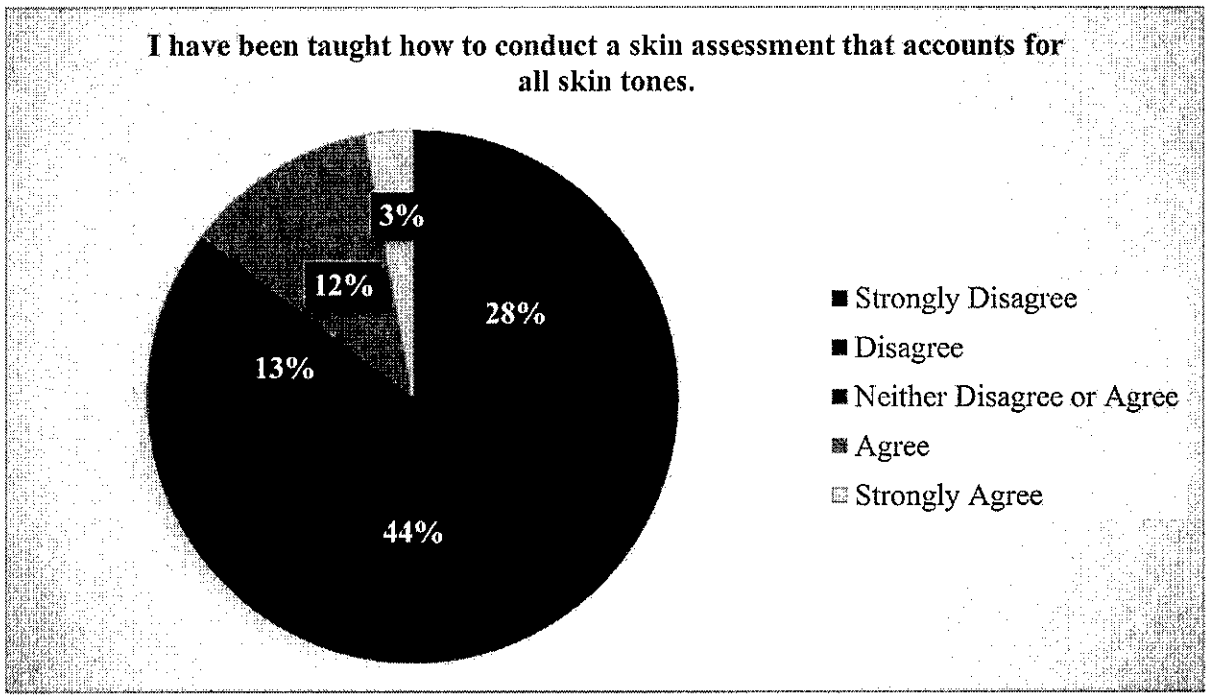


Field note findings from six individuals found that four did not report the resources sparked conversations with colleagues, while two did.

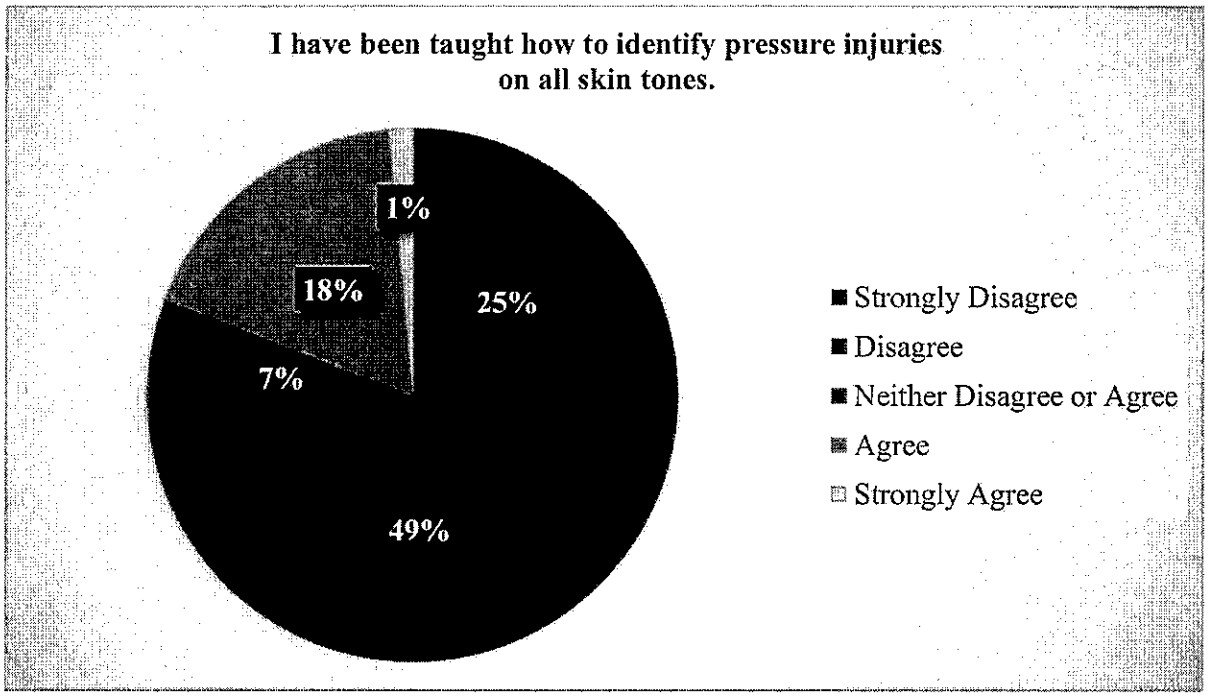


Field note findings correlated with survey findings. Three respondents reported they were "appalled by how many more PI are missed", "the numbers of incidence is ridiculous how many are missed", and "I assumed there were disparities but didn't know the numbers." Another reported "it makes me questions what have we been doing?" and that they "haven't really thought about this, I guess because of white privilege and because most of our population has skin tones that can visually see changes." One respondent stated "I never even thought about it. I assumed it was the same [assessment] and it made me think of what other things can be different on assessment related to race or anything."

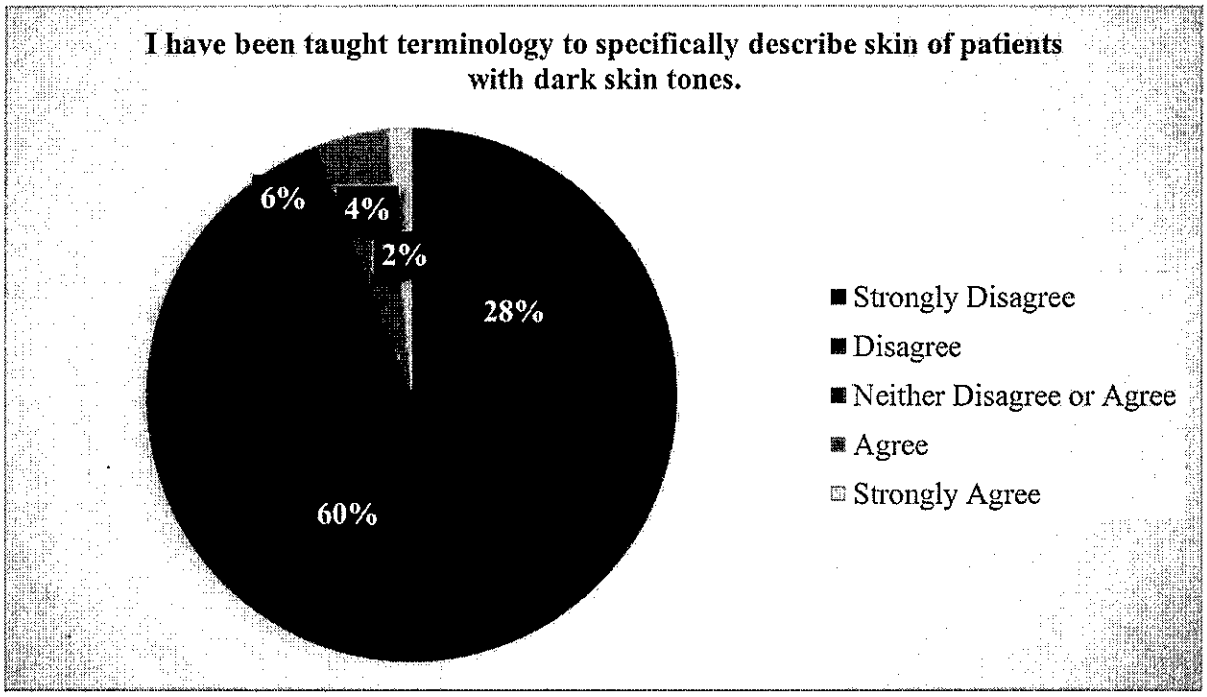
Training and Education.



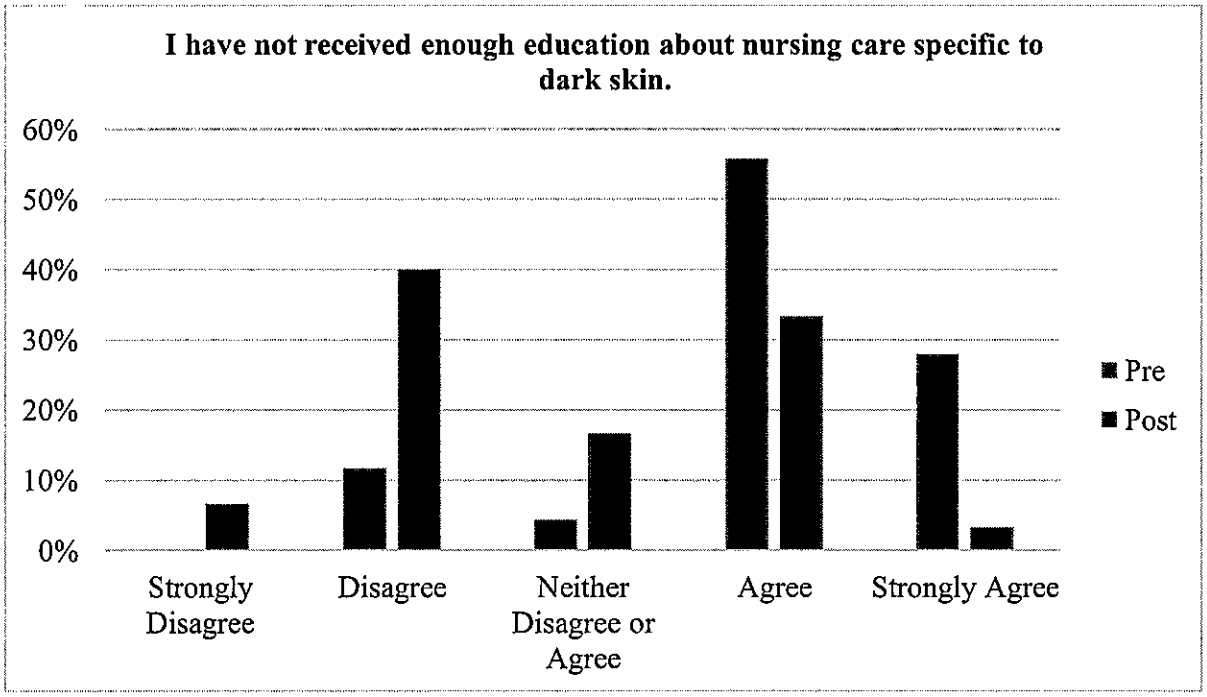
Of the 11 free-text responses to "if so, please indicate where", four responded nursing school, two RISC monthly PI education and training, two UW Hospital, two stated this project's emailed resources, one identified Unit B education, and one stated "UW" without specifying if UW Hospital or the nursing school. One response was "UW's education and charting is in predominantly for Caucasian skin tones." Field note findings mirrored survey results and were summarized in the above Organizational Tools, Resources, and Training section.



Of the 13 free-text responses to "if so, please indicate where", five responded nursing school, three UW Hospital, two stated this project's emailed resources, one RISC education, one identified Unit B education, one "Michigan", and one stated "UW" without specifying if UW Hospital or the nursing school. One response was "UW's education and charting is in predominantly for Caucasian skin tones." Field note findings mirrored survey results and were summarized in the above Organizational Tools, Resources, and Training section. When individuals were asked who or where they go to if they have questions on PI identification, four stated their unit RISC nurse, two the unit-based CNS, and two would consult the WOCN.



Of the four free-text responses to "if so, please indicate where", one stated UW Hospital and one "Michigan." One response stated "not that I recall" and another "UW only educated me on Caucasian skin tones."



Field note findings correlated with survey results. All six individuals reported they did not have enough education on the nursing care of DST. A respondent stated dark skin tone assessment education was "an integral miss in nurse education." A second respondent echoed the need for "education for new nurses that there's a different kind of assessment" related to dark skin tones. Another individual stated "I've never had a discussion pinpointing dark skin needs."

Resources and Tools. As previously discussed in the Action Item Outcome section above and visualized in Appendix I, the project successfully created a video, written resource sheet, and received approval for the additional 10 terms into current nursing documentation to align with guideline recommendations related to PI and DST. The following survey questions evaluated the nurse satisfaction, feedback, and perceived impact from the project educational material interventions, not otherwise categorized as competency outcomes:

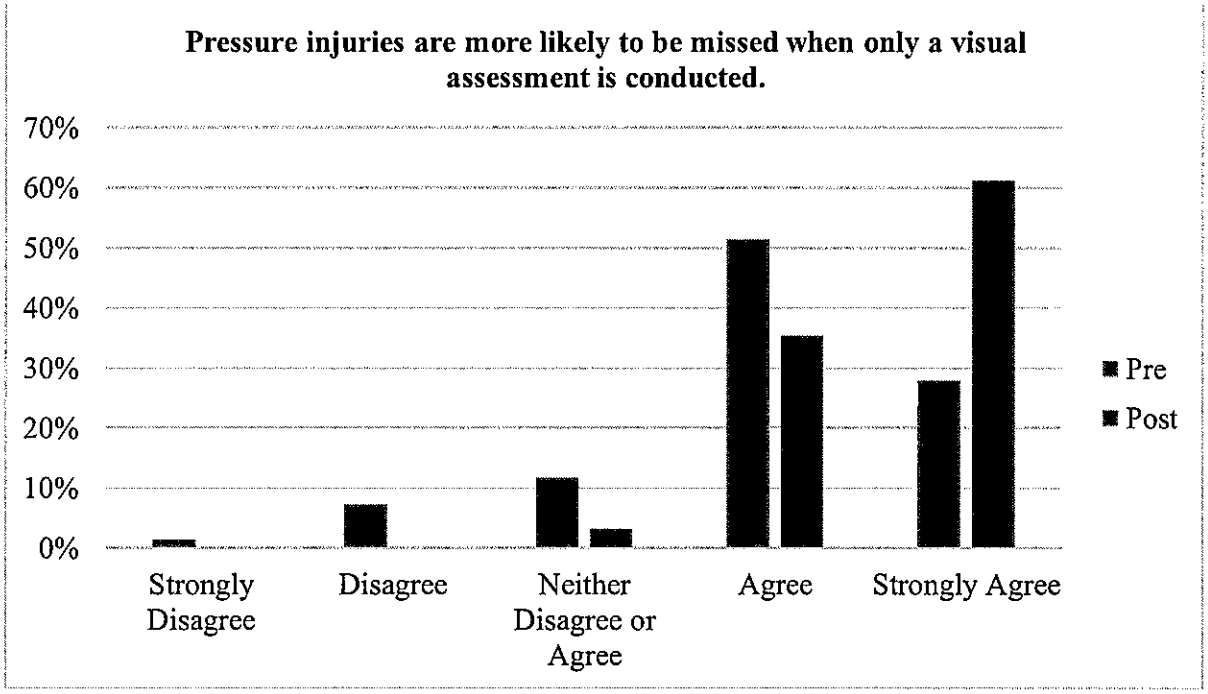
After viewing the video and reference sheet for the skin assessment and documentation of patients with dark skin tones:			
Survey Question	**Number of Responses**	**Thematic Response Analysis**	**Field Notes**
What has been the most valuable?	22	-12 mentioned the video -5 discussed the resource/reference sheet -4 mentioned terminology -3 stated the staging card images -2 discussed the knowledge of increased risk and importance of recognition related to PI and DST	-4 discussed the video specifically as "the best resource", "after watching the video I wanted to ask my dark skin toned coworkers more and to practice assessing on them" and discussed the takeaways of touch, pain, and color options -2 stated they had a hard time remembering video components -2 did not review the resource sheet -1 stated the resource sheet was "helpful for a quick reference"
What surprised you?	21	-8 discussed tactile, touch or palpation assessment -6 mentioned the DST PI problem, incidence, or disparity -4 stated early signs and PI differences on DST	-2 discussed the tactile assessment and stated "you can't see bogginess and have to feel" or "I didn't realize how important the tactile assessment was" -1 discussed the need for natural light for assessments

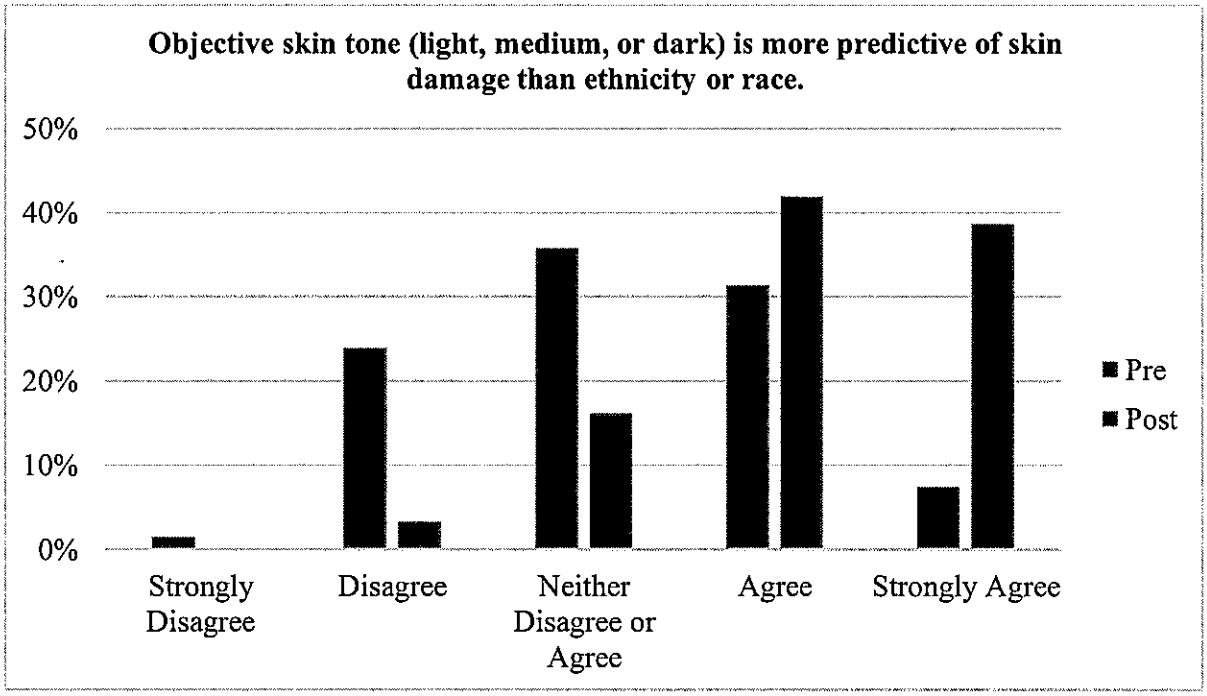
		-2 stated DST may not blanch -1 mentioned terminology	-1 mentioned that Stage 1 PI were missed more and DTIs mistaken for bruises
What questions remain about this topic?	16	-8 stated none or N/A -3 discussed a desire for formal education such as mandatory annual CBTs, more education in general, and education shared with all organization RNs -2 requested hands-on experiences and practice -1 requested picture examples -1 asked if charting would change -1 asked about preventative interventions like foam protective dressings for DST -1 asked how to assess localized pain in intubated or sedated patients	-3 denied further questions -2 stated they wanted more visual examples of wounds and PI on DST -1 expressed wanting to learn more about documentation -1 requested examples of the impact of lighting on skin assessment

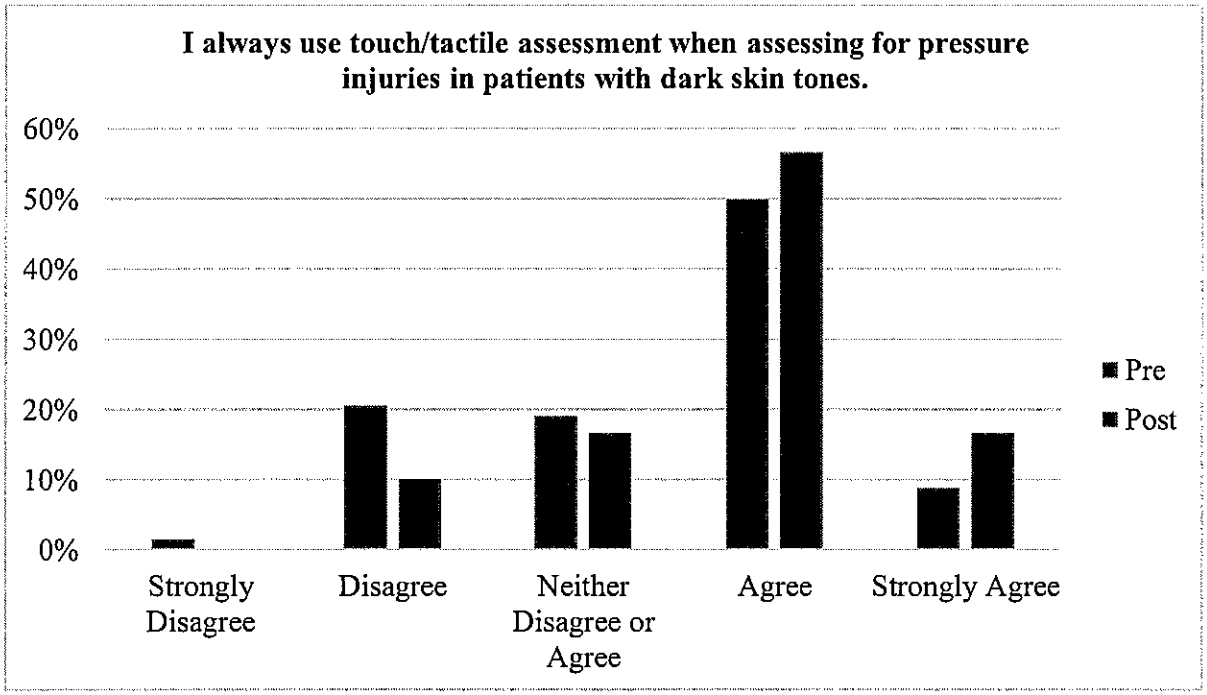
During field note collection, when nurses were asked how they would use the resources, four felt they would use them for educating and training new nurses or nursing students. Two discussed using the resources personally by printing out the NPIAP Staging Card and keeping as a resource at work. When asked where these resources should be disseminated or live, five expressed wanting physical access to the resource sheet and Staging Card on their unit. Two reported the Wound and Skin intranet page. One expressed a need in new nurse education and unit orientation materials. Another discussed the need for organizational annual review content to include wound and skin.

Competencies. The following survey questions were used to evaluate changes in RISC and ICU nurse knowledge, practice, and perceived impact of the project education materials. Please review the previous graph exhibiting results to the survey question "Patients with DST are

at higher risk for developing more severe PI than patients with light skin tones" inserted above in the Awareness, Perceptions, and Beliefs outcome section.






I always use touch/tactile assessment when assessing for pressure injuries in patients with dark skin tones.
60%
50%
40%
30%
20%
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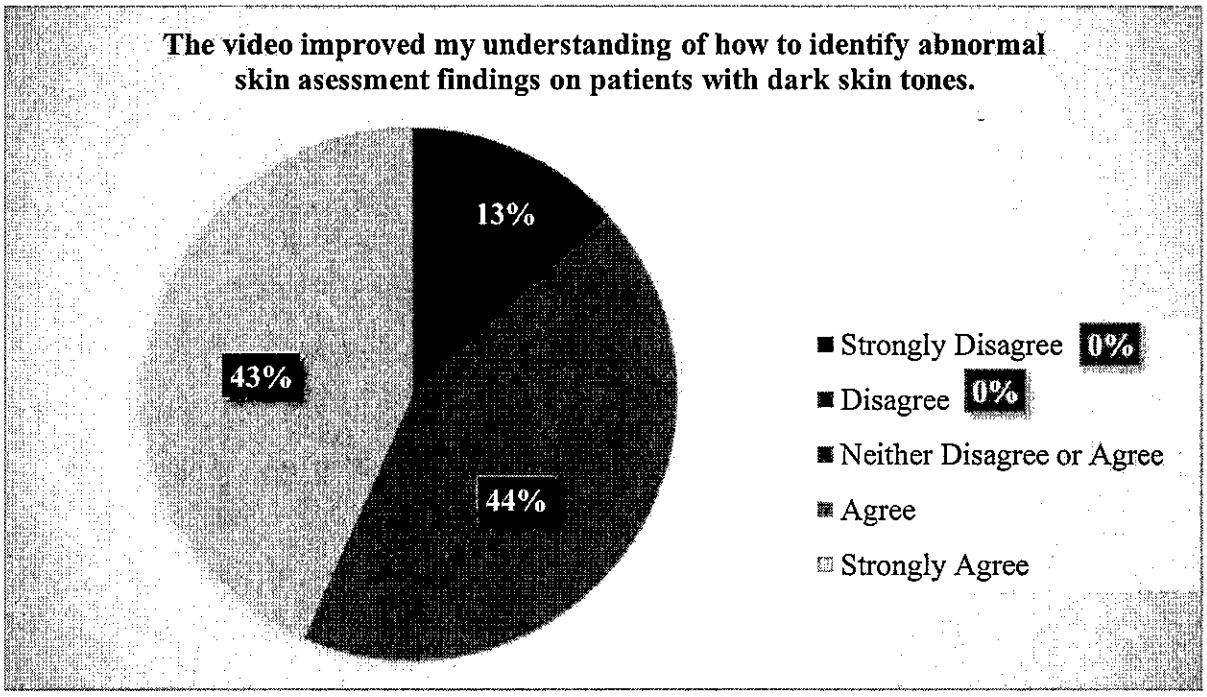
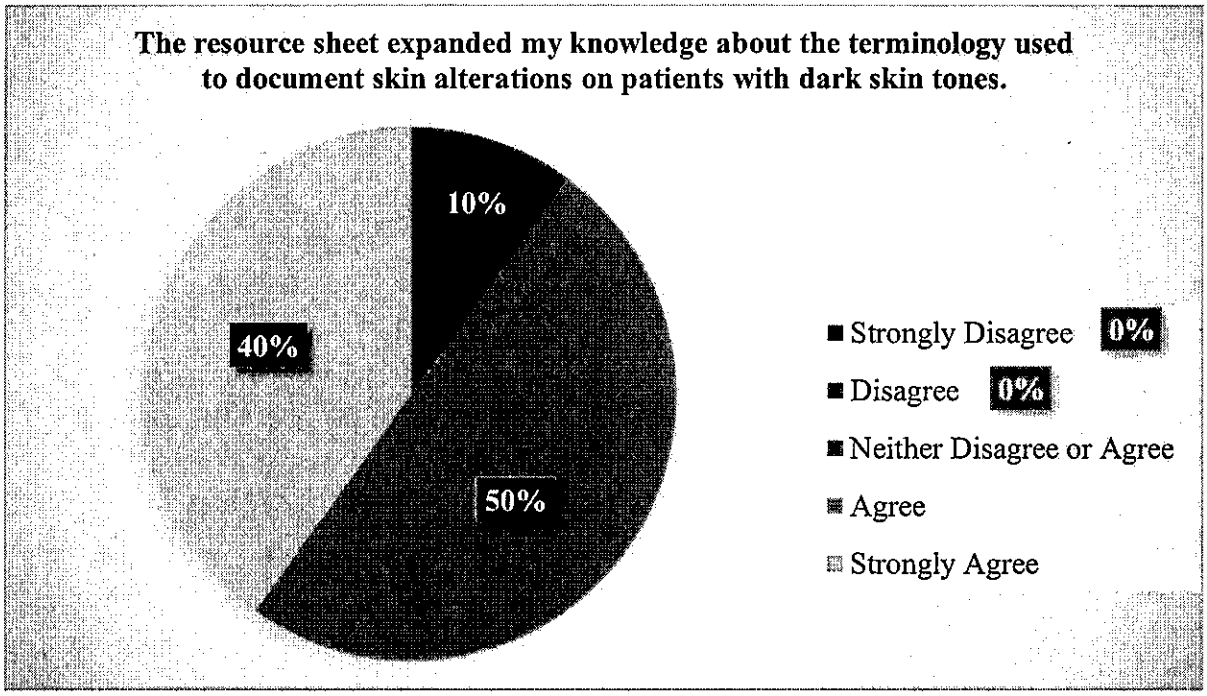
Strongly Disagree
Disagree
Neither Disagree or Agree
Agree
Strongly Agree
Pre
Post


The video improved my understanding of how to identify abnormal skin asessment findings on patients with dark skin tones.
13%
43%
44%
Strongly Disagree 0%
Disagree 0%
Neither Disagree or Agree
Agree
Strongly Agree



After viewing the video and reference sheet for the skin assessment and documentation of patients with dark skin tones:			
Survey Question	**Number of Responses**	**Thematic Response Analysis**	**Field Notes**
What have you put into practice or plan to put into practice?	21	-16 discussed changes to their skin assessment (14 related to tactile, touch, and palpation; 2 included pain and sensation) -3 mentioned engaging coworkers through "talking to", "educating", and "bringing a second nurse with me to confirm a correct assessment" -1 stated using terminology specific to DST	-4 discussed the touch or tactile assessment -2 stated they had not changed practice at that time -1 stated they were "putting preventive foam on intubated patients" with DST

Discussion

The results and findings above provide significant information regarding current tools, resources, and training along with professional level outcomes. Consistent with the review of the organization's current state and lack of resources specific to PI and DST, nurses recognized a need for organizational assessment and documentation resources. When surveyed, the majority of nurses disagreed (67.65%) or strongly disagreed (25%) that their unit/work environment had

formal training for nurses on the skin assessment of DST. The majority of nurses disagreed (48.53%) or neither disagreed or agreed (23.53%) that UW Health had resources for assessing the skin of patients with DST. The majority disagreed (57.35%) or neither disagreed or agreed (25%) that UW Health had resources for documentation terminology of patients with DST. Of nurses surveyed, 50% neither disagreed nor agreed and 35.29% disagreed that current nursing documentation supported everything they wanted to document regarding their assessment of patients with DST. The availability of organization-specific tools, resources, and training related to PI and DST had not specifically been addressed in the literature.

With the creation of the project education materials (video and resource sheet), nursing awareness, perceptions, and beliefs related to PI and DST increased and improved. The majority of nurses (61.29%) strongly agreed that patients with DST were at higher risk of developing more severe PI than patients with light skin tones, which had increased from 13.24%. The nurses had an increased perception of comfort assessing skin of patients with DST with those that agreed increasing from 13.43% to 70.97%. Perceived nurse confidence in the terminology for documentation of skin assessments on DST improved with the majority agreeing (73.33%), an increase from 4.48%. The resources successfully sparked conversations with coworkers related to nursing care of the patient population as 54% of nurses agreed and 33% strongly agreed. The resources (video and reference sheet) increased nurse awareness of the PI disparities for DST as 47% agreed and 43% strongly agreed.

Similar to the literature, the majority of nurses reported a lack of education and training surrounding skin and pressure injuries on DST. Forty-four percent of nurses disagreed with being taught how to conduct a skin assessment on all skin tones and 28% strongly disagreed. Forty-nine percent disagreed and 25% strongly disagreed that they were taught how to identify PI on

all skin tones. Sixty percent disagreed and 28% strongly disagreed that they were taught terminology to specifically describe skin of patients with DST. Prior to the education resources, the majority of nurses agreed (55.88%) they had not received enough education on the nursing care of dark skin. After the educational material intervention, this dropped to 33.33% and the majority disagreed that they had not received enough education (40%), an increase from 11.76%. The project education materials improved the nursing perception and satisfaction with available education resources.

The successful creation of the video and resource sheet educational materials along with the supplemental NPIAP Staging Card and relevant article were effective at improving nursing knowledge, satisfaction with available education, and professional buy-in and request for organizational integration. Nurses found the video the most valuable followed by the resource sheet and the NPIAP Staging Card. The nursing feedback emphasized the value in learning about correct terminology and descriptions for documentation. Nurses were most surprised by the tactile and palpation assessment priority for DST, followed by the disparities related to PI and DST, and the early signs and differences of PI comparing light and dark skin tones. Most nurses did not have further questions after the educational material intervention. Those that did discussed a need for further education and requested dissemination throughout the organization, with hands-on experiences and more visual picture examples.

The project educational resources improved nurse competencies, specifically knowledge related to PI and DST with a self-perceived impact on future nursing practice. After the educational resources were shared, more nurses strongly agreed that patients with DST were at higher risk for developing more severe PI, that PI were more likely to be missed when only a visual assessment was conducted, and that the use of objective skin tones was more predictive of

skin damage than ethnicity or race. The majority of nurses perceived the video was an effective resource and improved their understanding of how to identify abnormal skin assessment findings on DST (44% agreed and 43% strongly agreed). The majority perceived the resource sheet was effective and expanded their knowledge of terminology for documentation of skin alterations on DST (50% agreed and 40% strongly agreed). There did not appear to be a significant change in reported practice related to the use of touch/tactile assessment for PI in DST. The majority of nurses agreed (50%) to always using tactile assessment prior to the education materials and increased to 56.67% after the education. The percent who disagreed decreased from 20.59% to 10%. When nurses were asked if they had or planned to put anything related to PI and DST into practice, the majority discussed changing their skin assessment and prioritizing tactile, touch, or palpation as well as pain and sensation. Nurses also reported a self-motivation to further engage coworkers through conversations, education, and utilizing them as resources and a "double check" on skin assessment techniques and findings.

As the project lead, I was surprised by the willingness of staff nurses to have frank conversations regarding race, healthcare disparities, and biases. Although there was a limited number of nurses included in the field note data, their honesty in the evaluation of project resources and apparent self-reflection regarding their own care of patients with DST highlighted that the nurses understood larger scale barriers to the care they provided. This included their nursing education experiences, predominance of light skin toned patient population, limited availability of their unit RISC RN, and prior limited awareness of the healthcare disparities surrounding PI and DST. They used phrases such as "white privilege", "I don't think people know about this [disparity]", "it struck me that I could not be seen as a skin champion because I can't tell a Stage 1 [on DST]", "how do we address innate bias against dark skin…that's a bigger

social issue", and "I wish I would've known this." I was also surprised by the unsolicited posting of the NPIAP Staging Card on two of the ICUs, likely done by staff RNs one near the unit sink and another in a frequent staff bathroom. Another unexpected outcome was the number of nurses who verbally (3) or electronically via email (2) and social media (1) sought me out to express gratitude for the needed educational resources and the profound need for the conversation regarding care for DST. Another takeaway from conversations with nurses was the variance in who they believed was responsible for their education related to skin and wounds. The majority identified the responsible party as their unit RISC nurse, followed by their unit CNS. Others discussed the WOCN, nursing education department, and nurse resident or new employee education.

Limitations

The greatest project barrier was the current COVID-19 pandemic in which precautions restricted several components of the project. With the cancelation of in-person monthly RISC meetings, the educational interventions were strictly virtual. The lack of meeting individual RISC nurses, opportunities for open discussion and direct feedback, and in-person administration of surveys likely limited relationships, buy-in, the amount of qualitative and quantitative data obtained specific to professional outcomes, as well as the survey completion rates. Monthly assessments of organization-wide inpatient skin and wounds by RISC nurse audits were paused over the winter months and decreased from monthly to quarterly quality reporting of PI rates. This restricted the measurable outcomes to professional and organizational, without the ability to collect timely data on patient outcomes during the project implementation and evaluation phases. The inability to have in-person meetings and requirement for virtual meetings potentially limited the extent to which interpersonal relationships were built and delayed adoption and approval of

project components, such as the documentation changes with NI and NDC and organizational adoption of the objectives skin tone assessment tool with CCKM and the Office of DEI. The addition of approved terminology to the EHR flowsheets and approval of the objective skin tone assessment tool were delayed to prioritize urgent pandemic-related EHR needs. Time was a known constraint to the project as many of these interventions were dependent on Information Technology (IT) capabilities and build time.

A significant constraint of the nursing education materials was the limited access to examples of PI on DST. A volunteer model with DST was used for the video to model a skin assessment, however, the model patient lacked PI or visible skin alterations. Since the organization did not stratify PI data by patient skin tone, there was not a way to access individual charts for image examples to include in the educational resources. The project lead was only able to disseminate guideline stock images of PI on DST per copyright and Health Insurance Portability and Accountability Act (HIPAA) restrictions. This may have limited the nurse outcomes of training and education, resources and tools, and competencies. Furthermore, the use of surveys to evaluate nurse comfort and confidence in assessment and documentation skills may have resulted in over-reported, or overestimated abilities compared to the ability to collect observational data.

A limitation of the result data quality was the limited survey response rates and field note participants. As email reminders were the only means to solicit nurse completion rates of surveys, there were undoubtedly limitations to this recruitment method. Unsurprisingly, Unit C had the highest response rates for pre- and post- surveys likely because this was the unit the project lead was employed and able to verbally remind colleagues to complete the surveys. This was the only unit the project lead obtained field notes based solely on convenience sampling

with staff nurses the project lead happened to work with during the two week post-survey interval. The field notes were obtained by the project lead which may have impacted the content nurses shared. The limited number field note participants was due to time constraints, hospital acuity, and inability to access or seek nurse input outside of work due to lack of contact information aside from email. A potential strength of the field notes obtained from the project lead's colleagues was their prior relationships that fostered open, honest, and rich dialogue surrounding disparities, biases, and personal beliefs.

Implications for Practice

Project results and findings support an overarching need for organizational cultural awareness of the skin needs of patients with DST and PI. Undergraduate nursing education lacks diversity considerations and does not include assessment and documentation term needs of patients DST, specifically for PI. It is recommended nursing programs include relevant education materials. Organizations and nursing units or departments do not offer regular, formal nurse education and training or resources specific to skin assessment of PI inclusive of DST. It is recommended that formal education is developed and implemented in a formal process either through new employee orientation, nurse residency programs, unit-based competencies, and/or via computer-based training (CBT). It is also recommended that visual and written resources are easily accessible at the organizational level via intranet access. To improve earlier identification of PI in DST, emphasize the tactile skin assessment, and refer to skin by objective skin tone, it is recommended relevant terms are included in nurse education, resources, and EHR documentation. To improve organizational availability of resources for documentation terminology of patients with DST, it is recommended that organizations adopt and include guideline-recommended terms in nurse PI education and resources. Because nurse education

resources improve nurse awareness, perceptions, beliefs, and competencies, it is recommended that organizations create resources specifically for nurses related to the assessment and documentation of PI in patients with DST.

It is anticipated that with improved nurse knowledge on the assessment and documentation of DTIs in DSTs and an EHR that supports the documentation of DST terms and objective skin tones, an organization will see an initial rise in PIs and DTIs among patients with DST. Future project evaluation could assess if PIs are identified earlier and at lower PI stages (Stages 1 and 2) compared to Stage 3, 4, and DTIs, if the accuracy of documented DTIs in DST has improved throughout the organization, and if the use of available inclusive language and terminology for wound assessments of DST prompts staff to recognize normal versus abnormal skin with respect to diversity and leads to earlier implementation of prevention efforts and overall improved PIP bundle compliance. Likewise, further evaluation could assess data stratified by the objective skin tone assessment to allow for greater understanding of the relationship between DST and PI stages, improved accuracy of reported DST and PI data, and further identify healthcare disparities as well as research and guideline gaps for DST care related to PIs.

Sustainability

Organizational commitment to minimize healthcare disparities, the recent expansion and vision of the Office of DEI, and persistent national prioritization of the BLM movement support organizational and provider buy-in and commitment to initiatives such as this project. The profound interest, engagement, and support of the project, from bedside providers to organizational leaders, solidified a plan for sustainability. The increased provider awareness, perceptions, and beliefs, access to novel training, education, and resources along with EHR

functionality that supports practice change, offer multiple modalities to support project sustainability at the provider and task levels.

The project short-term aims and action items have clear next steps and organizational leaders that have assumed responsibility for their progress. The WOCN department assumed ownership and maintenance of the video with the project lead to complete an IT ticket for its upload to the WOC intranet page. The EBP CNS, along with the Research and EBP Council, took ownership of the transition of the resource sheet into a formal TRIP sheet, approval from Nursing Practice Council, maintenance of content and resources, and IT ticket request for upload to the TRIP intranet page. Documentation terms are currently being built by the EHR IT support department with an undetermined go-live date. Nursing Documentation Committee has assumed ownership of these documentation changes and inquired about the following organization affiliates' interest in the updated documentation: Agrace Hospice, American Family Children's Hospital (AFCH), Swedish American, and UW Health Inpatient Rehabilitation Hospital. Nursing Informatics committed to ensure these terms are included in the Wound LDA go-live which has an undetermined date and is intended to support inpatient and ambulatory care area documentation. With the recent approval from CCKM for organizational adoption of the Munsell Color Chart 5YR, the project lead requested NDC and NI agenda time to request approval for the proposed EHR documentation location. Once built, a communication and education plan for bedside nurses will be led by the RISC CNS (project sponsor) with partnership from the inpatient CNS group and WOCN group in the form of a PIP tidbit and/or Computer-Based Training (CBT).

To sustain the interpersonal relationships made throughout the organization, the project lead intends to disseminate project findings, as discussed below, with a close relationship with

the Chief Diversity Officer, Office of DEI, and the Cultural Congruence Resource Nurses and email introduction to the oncoming responsible parties. The project lead has committed to maintain a relationship with the School of Nursing and the organization's Research and EBP CNS in an effort to identify a student to handoff the quality improvement project over with next steps focused on the medium-term aims. The following aims offer future project direction and next steps:

Medium-Term Aims:

- Evaluate the practice and value of the addition of guideline recommended terminology to the EHR nursing documentation
- Implement and evaluate EHR documentation of an objective skin tone tool and further data stratification of PIs by skin tone and use of added terminology that meets diverse population needs
- Disseminate and evaluate educational resources throughout UWH organization-wide
- Evaluate nurse competencies and whether knowledge has transitioned to practice change
- Increase organizational awareness of the problem and healthcare disparities

Long-Term Aims:

- Implement a formal, structured nursing education program specific to the nursing assessment and documentation of PIs inclusive of all skin tones
- Systematic efforts for improved nursing assessments and documentation availability for earlier identification of PIs on DST
- Organizational culture change within UWH that prioritizes the skin and wound needs of patients with DST in a culturally congruent manner
- Decrease the incidence and prevalence of PIs among UWH patients with DST

Dissemination Plan

Survey results and project findings will be shared via email to the following leaders and groups: RISC CNS (project sponsor), Wound, Ostomy, and Continence Nurse (WOCN) group, including WOCN content expert and manager, EBP CNS, Survey Subcommittee, RISC and ICU nurses from intervention units, and the Chief Diversity Officer within the Office of DEI. Agenda meeting requests to present findings will be sent to the following groups: WOCN, RISC, Diversity and Cultural Congruence Resource Nurses, and the inpatient CNS group with the request for them to further disseminate in weekly updates and unit huddles. Once education resources are uploaded to the organization intranet, information will be shared with the UWH Nurse Resident program lead to disseminate at their monthly education days and the Nursing Education Department to share resource location during the Nurse Preceptor Courses offered quarterly. A formal project presentation is scheduled at the UW School of Nursing Scholarly Project Symposium on April 29, 2021. The project lead aims to submit a presentation request at UWH Nursing Grand Rounds for the upcoming fiscal year starting in July 2021. Further dissemination of findings and outreach by the project lead will include the UW School of Nursing undergraduate education program with continued conversations with the Multicultural Student Nursing Organization leaders and Doctorate of Nursing Practice program director to assist in providing educational materials for future nursing curriculum.

Conclusion

Hospital-acquired pressure injury rates were a patient quality metric of high organizational priority. Patients with DST have proven to have increased PI morbidity and mortality rates, specifically with DTI. These healthcare disparities have been attributed to a lack of provider knowledge and formal training regarding the assessment and documentation needs of

patients with DST. By considering ways in which tools, beliefs, training, and resources shape nursing practice, the project identified barriers to effective, inclusive practice. The SEIPS Model 2.0 was an effective approach to structure this assessment, design interventions, and categorize outcomes. This quality improvement project implemented and evaluated novel video and written resource materials for RISC and ICU nurses, obtained organizational adoption of EHR documentation and tools in alignment with guideline recommendations, and increased organizational culture awareness and buy-in through the active engagement of organization leaders. Due to the project timeline and short-term aims, long-term patient outcomes such as PI rates, morbidity, and mortality among patients with DST were not evaluated. Instead the evaluation focused on the proximal organizational and professional outcomes. It is expected the action items and outcomes, over time, will directly impact patient outcomes.

The project correlated with the literature such that nursing education is not inclusive of dark skin tones and there is a lack of PI education and resources available to nurses at the academic level and organizational or employer level. This results in a knowledge gap, perceived lack of comfort and confidence related to the nursing assessment and documentation of DST that likely correlates with the incidence and prevalence of PIs in DST. This quality improvement project highlighted the impact of nurse educational materials, including a video modeling a skin assessment on patient with DST and a resource sheet that provided information in PI disparities, summarized available literature, and provided written steps for a skin assessment and documentation terminology. The dissemination of these educational resources for RISC and ICU nurses improved cultural awareness of the clinical problem and healthcare disparities, knowledge of assessment and documentation needs of DST, and perceived impact including the nurse

comfort in assessment, confidence in documentation, and plans for practice change. Due to the time constraints of the project, the direct impact on nursing practice change is unknown.

The project concluded that organizational cultural awareness and buy-in were pivotal to the successful adoption of guideline recommendations including EHR documentation terminology and assessment tools. Although originally a project limitation, the COVID-19 pandemic shifted the focus of this project to a wider scope and ultimately created a greater impact and ripple effect throughout the organization and affiliates. This quality improvement project highlights that practice that reduces disparate outcomes requires an upstream, systematic approach likely due to the systemic inequities that drive disparate outcomes. By improvements in nurse perceptions, knowledge, and awareness related to the assessment and documentation needs of patients with DST through educational resources and increased access to tools and resources with inclusive documentation language and an objective skin tone tool, an organizational infrastructure was created to lead and sustain professional practice and organizational culture change.

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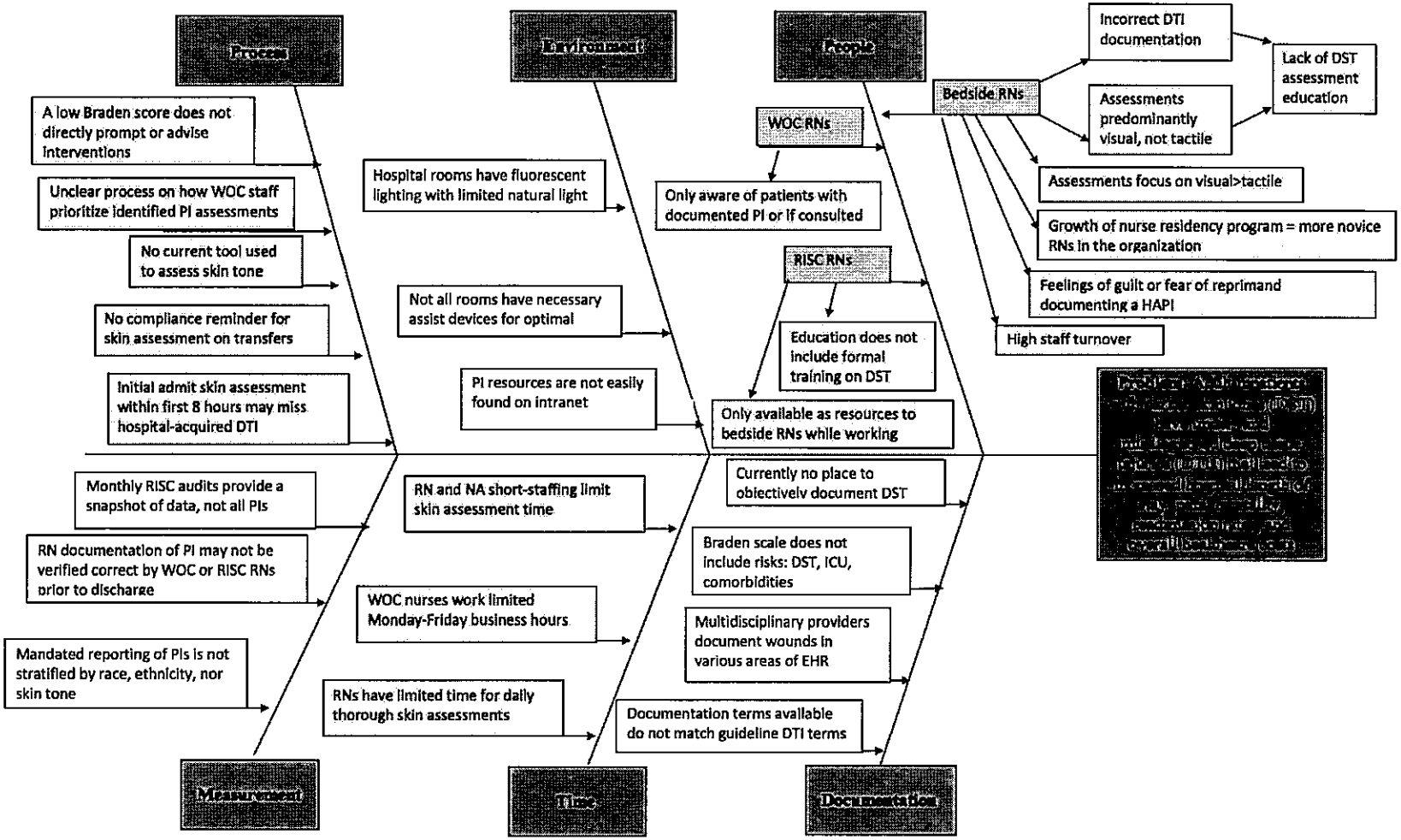
Appendix A

Fishbone Diagram



Appendix B

Natural History of Disease and Levels of Prevention

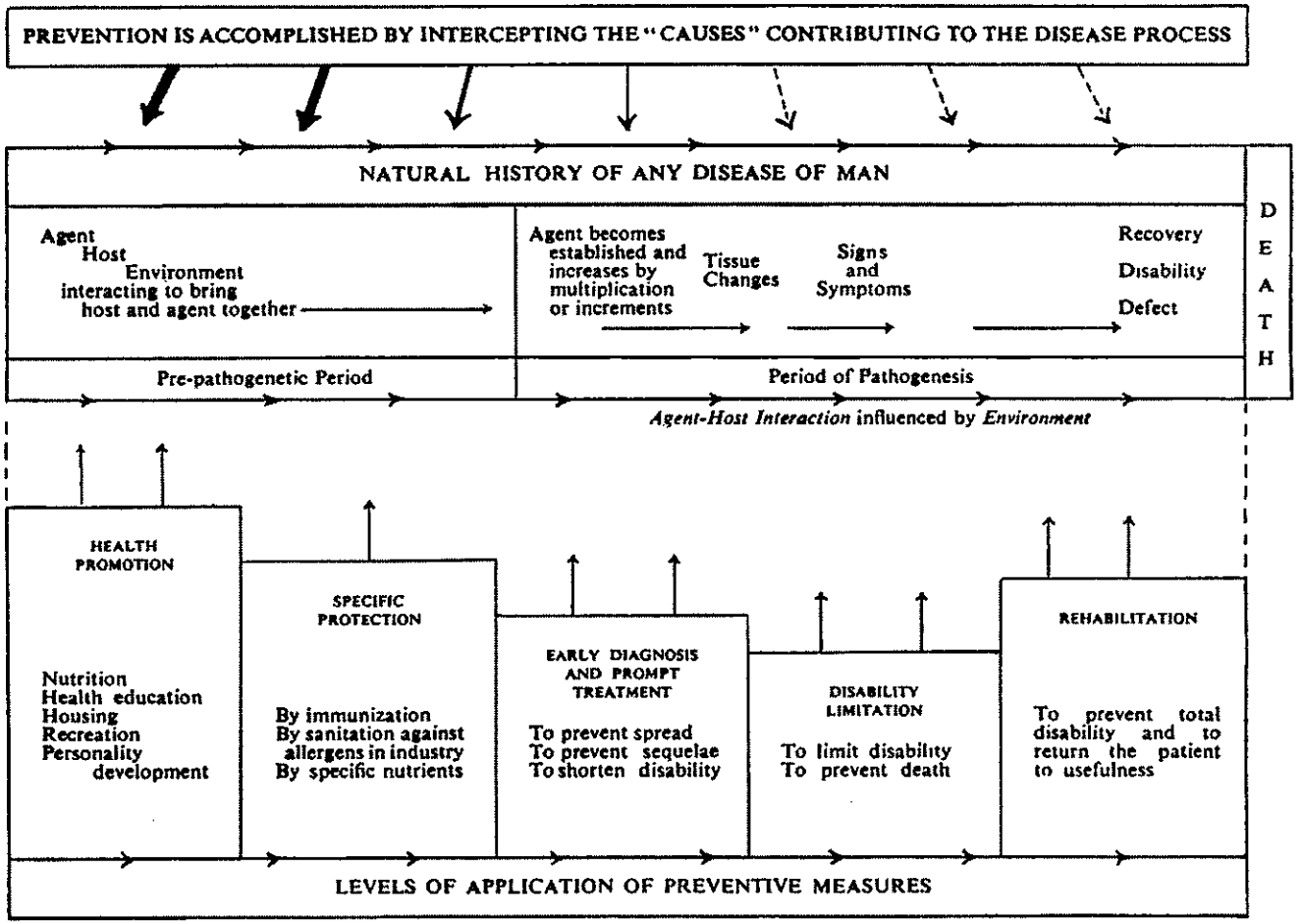
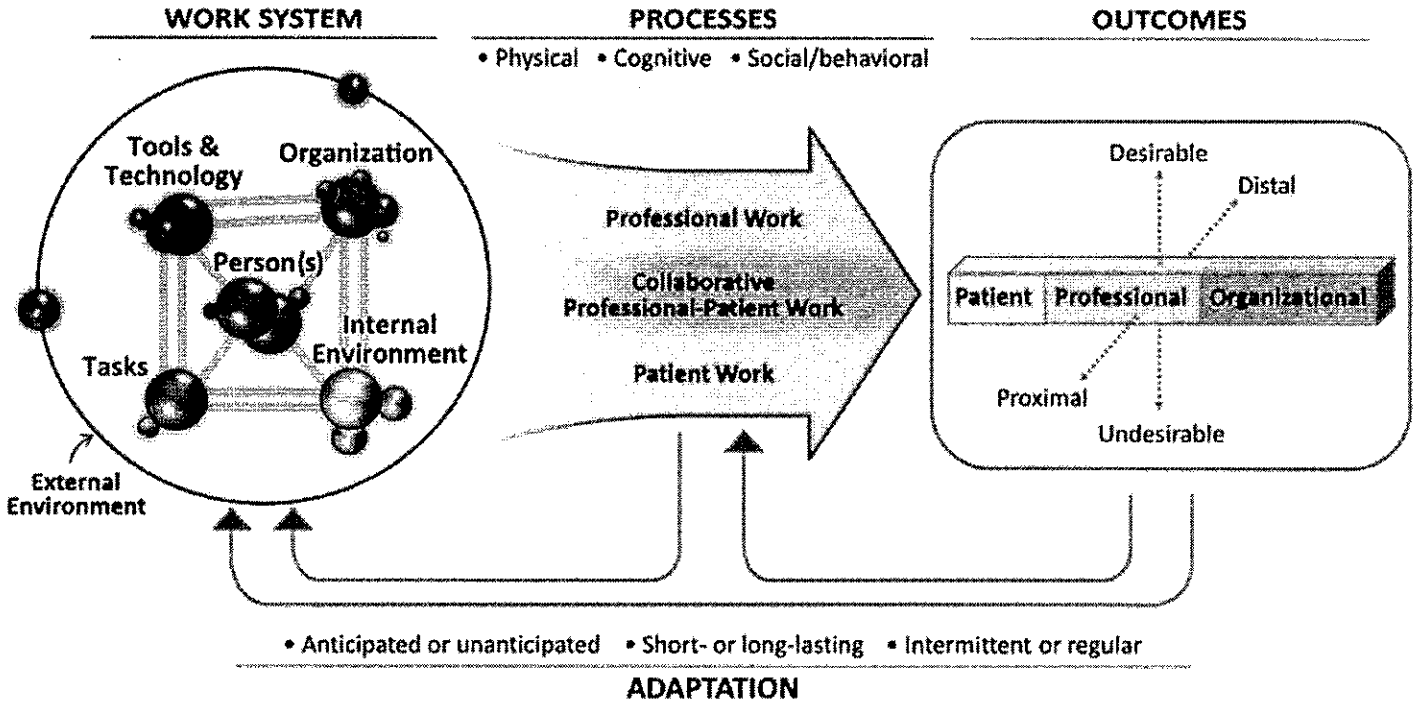


FIG. 1.—Natural history of disease and levels of prevention.

Appendix C

SEIPS 2.0 Model



Appendix D

Work System and Related Guideline Recommendations for Action Items

Work System	**EPUAP et al. (2019) Guideline Recommendations for Action Items**
Organization	• At the organizational level, assess the knowledge health professionals have about pressure injuries to facilitate implementation of an education program and a quality improvement program *(Strength of Evidence = B1: Most studies have consistent outcomes and inconsistencies can be explained; Strength of Recommendation = Weak positive recommendation)* • At an organizational level, develop and implement a structured, tailored and multi-faceted quality improvement program to reduce the incidence of pressure injuries *(Strength of Evidence = A: Consistent body of evidence; Strength of Recommendation = Strong positive recommendation)* • At an organizational level, develop and implement a multi-faceted education program for pressure injury prevention and treatment *(Strength of Evidence = B2: Most studies have consistent outcomes and inconsistencies can be explained; Strength of Recommendation = Strong positive recommendation). Consider including a computer-based component of education into a multi-faceted education program (Expert opinion)*

	• Evaluate the relevance of performing an objective assessment of skin tone using a color chart when conducting a skin assessment *(Strength of Evidence = B2: Most studies have consistent outcomes and inconsistencies can be explained; Strength of Recommendation = No specific recommendation)* • At an organizational level, include evidence-based policies, procedures and protocols and standardized documentation systems to reduce the incidence of pressure injuries *(Strength of Evidence = B1: Most studies have consistent outcomes and inconsistencies can be explained; Strength of Recommendation = Strong positive recommendation)*
Person (Nurse)	• At a professional level, provide education in pressure injury prevention and treatment as part of a quality improvement plan to reduce the incidence of pressure injuries *(Strength of Evidence = A: Consistent body of evidence; Strength of Recommendation = Strong positive recommendation: Definitely do it)*
Tools and Technology	• Assess and document anatomical location, category/stage, size and surface area, tissue type(s), color, peri wound condition, wound edges, sinus tracts, undermining, and tunneling, exudate, and odor *(Expert opinion)* • Evaluate the relevance of performing an objective assessment of skin tone using a color chart when conducting a skin assessment *(Strength of Evidence = B2: Most studies have consistent outcomes and inconsistencies can be explained; Strength of Recommendation = No specific recommendation)*

Tasks	• Carefully inspect any discoloration over pressure areas in individual with darkly pigmented skin. Areas of discoloration in relation to surrounding skin should be assessed more closely for temperature changes, edema, changes in tissue consistency and pain *(Expert opinion)* • Assess the physical characteristics of the wound bed and the surrounding skin and soft tissue at each pressure injury assessment *(Good Practice Statement)* • When assessing darkly pigmented skin, consider assessment of skin temperature and sub-epidermal moisture as important adjunct assessment strategies. *(Strength of Evidence = B2: Most studies have consistent outcomes and inconsistencies can be explained; Strength of Recommendation = Weak positive recommendation)* • Assess and document anatomical location, category/stage, size and surface area, tissue type(s), color, peri wound condition, wound edges, sinus tracts, undermining, and tunneling, exudate, and odor *(Expert opinion)* • Conduct a comprehensive pain assessment for individuals with a pressure injury *(Strength of Evidence= B1: Most studies have consistent outcomes and inconsistencies can be explained; Strength of Recommendation = Strong positive recommendation)*

Appendix E

Action Items and Steps Taken

SEIPS 2.0 Work System	Aim	Action Item	Steps Taken
Person	Improve nurse awareness, knowledge, and perceptions of the assessment and documentation needs of patients with DST, specifically related to PIs Create and implement educational resources related to the skin assessment and documentation of patients with DST	Create video demonstration of the assessment of a patient with DST. Create a written resource sheet for staff to reference on the assessment and documentation needs of patients with DST.	-Created and distributed needs assessment survey of RISC nurses to identify educational needs prior to creating content -Created nurse pre- and post-surveys to identify knowledge gaps and current state and educational material evaluation -Approval of pre- and post-surveys from the Survey Subcommittee prior to survey distribution -Created, obtained approval from WOCN, and distributed education video -Created, obtained approval from WOCN, and distributed the resource sheet
Tools and Technology	Systematically guide practice and improve documentation through the addition of inclusive, evidence-based terminology and tools in the EHR	Match the upcoming Wound LDA and nursing assessment flowsheet terminology to the terms and language recommended by current guidelines that are inclusive of darker skin tones.	-Compiled guideline and literature recommended terminology -Pitched documentation terminology additions to WOC content expert, RISC CNS leader, NI lead -Sought approval and support from DEI -Pitched presentation to NDC for organizational addition of 10 terms to current nursing flowsheet -Met with NDC, NI, and IT to assist in the build addition of 10 terms -Reviewed the evidence and guidelines and requested approval for dissemination to AFCH pediatric population -Transitioned ownership to NDC

	Create a way to stratify wound data by skin tone for a deeper analysis and awareness of patient populations most at risk for health care disparities.	Organizational adoption of an objective skin tone assessment tool (Munsell Color Chart 5YR) within the electronic health record.	-Compiled literature recommendations and created proposal for organizational adoption of the Munsell Color Chart 5YR -Pitched to Nursing Informatics -Pitched to and sought approval from CCKM -Sought approval and support from Diversity, Equity, and Inclusion (DEI) -Requested agenda time from NDC and NI for approval to build
Organization	Build interpersonal relationships and promote buy-in throughout the organization to facilitate and sustain organizational initiatives, practice change, and culture to improve the skin and wound needs of UW Health patients with DST	Active engagement and inclusion of organizational leaders and groups.	Contact and active involvement with: -WOC CNS -WOCN content expert -WOCN group -RISC nurses -RISC CNS leader -ICU nurses -Council of Unit Chairs leaders -Unit Councils (TLC & F4M5) -Research and Evidence-Based Practice CNS -Unit or Population CNSs (B4/4, B4/5, TLC, F4M5, B6/6, pediatric) -Nursing Informatics -Nursing Documentation Committee -Office of DEI -Chief Diversity Officer -CCKM -Diversity and Cultural Congruence Resource Nurse -Information Technology department -Survey Subcommittee -Nursing Research and EBP Council

Appendix F

Resource Sheet

Resource Sheet:
Skin Assessment and Documentation of Patients with Dark Skin Tone (DST)

What does the literature say about skin assessment and documentation of patients with DST?

- Patients with DST are more at risk for pressure injuries (PI).
- Black race or Hispanic ethnicity are independent risk factors for PI. Of U.S. patients with a hospital discharge diagnosis of PI, 32% identified as African American.
- The mortality rate for African American patients with a PI is 9.1% compared to 1.8% for Caucasian patients.
- Healthcare providers recognize PI on DST at later stages which causes delayed interventions and treatments, underdiagnosed comorbidities, and increased hospital length of stay and mortality.
- Current guidelines recommend regular PI prevention and treatment education include assessment techniques and documentation of PI characteristics and terms specific to darkly pigmented skin.
- Providers have difficulty identifying pressure-related changes on visual inspection alone, as the naked eye cannot discern blanching nor discern a Stage 1 versus DTI in patients with DST. Tactile characteristics are more likely to assist in DST assessments. Pain is a key symptom in PI assessment, especially in DST.
- Skin tone is more predictive of skin damage than ethnicity or race. Objective skin tone or pigment scales, such as the Munsell Color Chart, have shown increasing sensitivity of DST PI risk assessment for clinical practice and research.

Who does this apply to?

- All patients (pediatrics and adults) with dark skin tones
- Patients with skin types rich in melanin pigments including, but not limited to, Black, Indigenous, and People of Color (BIPOC)

Benefits & Harms

- Benefits
  - Consistent skin assessment of DST
  - Earlier identification of pressure injuries
  - Assists in identifying the need for interventions
  - Improved patient outcomes
- Harms
  - No harms identified

What does this mean for UW Health nurses?

Skin assessments of patients with DST should include the following, specifically for areas at risk for tissue injury such as bony prominences and medical device locations:

1. Inspect for erythema, discoloration, or changes in texture or color from surrounding skin. Assess for skin that appears taut or shiny. Color changes on DST may appear more blue, purple, maroon, gray, brown, or black in color with a shiny or taut appearance.
   a. Moisten the skin with water to better visualize color changes
2. Palpate for areas of tissue inconsistencies such as induration often described as hard, firm, or boggy often caused by underlying sub-epidermal moisture/edema, infection, or inflammation.
   a. Assess blanching response by pressing the skin with a finger close to a capillary bed to assess the color return after releasing pressure. It is normal and common for dark skin tones not to have a visible blanch response.
   b. Use the back of your clean hand without gloves to best feel for temperature changes (cooler or warmer) compared to surrounding skin.
3. Ask the patient about localized pain or sensation changes.
   a. As you palpate over areas at risk for pressure injury, ask the patient if they have pain, numbness, tingling, or loss of sensation.
4. Document assessment findings that do not meet "Within Defined Limits" criteria either as:
   a. Localized skin alterations on the assessment flowsheet under "tissue integrity" expand the "skin alterations"
   b. An identified wound or pressure injury on the Wound LDA flowsheet

What additional resources are available?

- Video reference for skin assessment and documentation on patients with DST https://www.youtube.com/watch?v=vXZmqWXXwJw
- NPIAP Staging for Darkly Pigmented Skin (attached NPIAP PDF)
- Articles:
  - Black, J., & Simende, A. (2020). Ten top tips: assessing darkly pigmented skin. *Wounds International, 11*(3), 8–11. https://www.woundsinternational.com/download/resource/8665
  - Cowan, L., McCoy-Jones, S., & Clements, C. (2018). *Conceptual and clinical look at pressure injuries in darkly pigmented skin* [PowerPoint slides]. 2018 Pressure Injury Conference. http://www.njha.com/media/536032/EDU-1871-PPT-CowanMcCoy-JonesClements.pdf
  - Oozageer Gunowa, N., Hutchinson, M., Brooke, J., & Jackson, D. (2018). Pressure injuries in people with darker skin tones: A literature review. *Journal of Clinical Nursing, 27*(17–18). 3266–3275. https://doi.org/10.1111/jocn.14062 (attached JOCN PDF)

Appendix G

Documentation Changes

Assessment Flowsheet, Skin Alteration Row			
Assessment:	Changes in:	Additional Documentation Options:	Literature Recommendations:
Tactile	Temperature	"cooler than surrounding tissue" "warmer than surrounding tissue"	"Assess the temperature of skin and soft tissue" • Strength of Evidence: B1 • Strength of Recommendation: Weak positive "When assessing darkly pigmented skin, consider assessment of skin temperature and sub-epidermal moisture as important adjunct assessment strategies." • Strength of Evidence: B2 • Strength of Recommendation: Weak positive (EPAUP et al., 2019)
	Texture	"firm" "boggy"	"Assess edema and assess for change in tissue consistency in relation to surrounding tissues." (Good Practice Statement) "Palpate the skin for induration" regarding physical exam techniques for dark skin tones (NPIAP, 2020, May 21)
	Sensation	"pain"	"Assess localized pain at every skin assessment. Localized pain at pressure points is a risk factor for pressure injuries." • Strength of Evidence: Good Practice Statement • Implementation considerations from Level 1 study "Ask about pain the area on palpation" regarding physical exam techniques for dark skin tones (NPIAP, 2020, May 21).
Visual	Discoloration	"black" "blue" "purple"	"Describe skin color and compare to the color of the surrounding skin" regarding physical exam techniques for dark skin tones (NPIAP, 2020, May 21).
	Consistency	"shiny" "taut"	"Inspection of the skin should include a visual inspection in conjunction with other skin assessment techniques such as touch and palpation for differences in temperature and tissue consistency" • Strength of Evidence: B1 • Strength of Recommendation: Strong Positive • Implementation considerations from a Level 2 study (EPAUP et al., 2019)

B1: Level 1 studies of moderate or low quality and Level 2 studies of high or moderate quality providing direct evidence
B2: Level 2 studies of low quality and Level 3 or 4 studies (regardless of quality) providing direct evidence
Strong positive recommendation: Definitely do it
Weak positive recommendation: Probably do it

Appendix H

Pre- and Post-Surveys

Pre-Survey: Assessment of Dark Skin Tones

Purpose: This survey aims to explore nurse perceptions, attitudes, and beliefs about assessing dark skin tones for pressure or deep tissue injuries. Additionally, this survey will gather information about your prior training, education, work environment, and access to resources. Current UW Health nurses from B4/4, B4/5, F4M5, TLC, and RISC nurses are invited to complete the survey. The survey is estimated to take 10 minutes to complete. Your participation is voluntary. All responses are anonymous. The data will be used to identify organizational resources, needs, roles, and opportunities for further quality improvement related to assessing dark skin tones.

1. What is your current role?
   a. RISC nurse
   b. ICU nurse
   c. Both RISC and ICU nurse
2. What is your current unit or department?
   a. B4/4 Neuro ICU
   b. B4/5 Cardiothoracic ICU
   c. F4M5 Cardiac Medicine ICU
   d. Trauma and Life Support Center (TLC)
   e. An adult general care area
   f. Other: (free text)

Please use the following scale to respond on how strongly you disagree or agree with the following statements:

3. Patients with dark skin tones are at higher risk of developing more severe pressure injuries than patients with light skin tones.
4. Pressure injuries are more likely to be missed when only a visual assessment is conducted.
5. Objective skin tone (light, medium, or dark) is more predictive of skin damage than ethnicity or race.
6. I have been taught how to conduct a skin assessment that accounts for all skin tones. If so, please indicate where. (Free text box)
7. I have been taught how to identify pressure injuries on all skin tones. If so, please indicate where. (Free text box)
8. I have been taught terminology to specifically describe skin of patients with dark skin tones. If so, please indicate where. (Free text box)
9. In my unit/work environment, nurses receive formal training on the skin assessment of patients with dark skin tones.
10. At UW Health we have resources for assessing the skin of patients with dark skin tones.
11. At UW Health we have resources for documentation terminology of patients with dark skin tones.
12. I have not received enough education about nursing care specific to dark skin.
13. I always use touch/tactile assessment when assessing for pressure injuries in patients with dark skin tones.
14. Current nursing documentation supports everything I want to document regarding my assessment of a patient with dark skin tone. Why or why not? (Free text box)
15. I am comfortable assessing the skin of patients with dark skin tones. Why or why not? (Free text box)
16. I am confident in the terminology for documenting skin assessment findings of patients with dark skin tones. Why or why not? (Free text box)

Post-Survey: Assessment of Dark Skin Tones

Purpose: This survey aims to evaluate the efficacy, perceptions, and impact of the recently shared education materials (video modeling a skin assessment on dark skin tones and reference sheet). Current UW Health nurses from B4/4, B4/5, F4M5, TLC, and RISC nurses are invited to complete the survey. The survey is estimated to take 10-15 minutes to complete. Your participation is voluntary. All responses are anonymous. The data will be used to create and distribute organizational resources and identify further opportunities for quality improvement related to assessing dark skin tones.

1. What is your current role?
   a. RISC nurse
   b. ICU nurse
   c. Both RISC and ICU nurse
2. What is your current unit or department?
   a. B4/4 Neuro ICU
   b. B4/5 Cardiothoracic ICU
   c. F4M5 Cardiac Medicine ICU
   d. Trauma and Life Support Center (TLC)
   e. An adult general care area
   f. Other: (free text)
3. In the past month did you review... (Yes, No, or Unsure)

...the video modeling a skin assessment on a patient with dark skin tone?
...the resource sheet that provided a) information on pressure injury disparities, b) a summary of the literature, and c) written steps to complete a skin assessment and documentation on patients with dark skin tone?
...the NPIAP Staging Card with images of pressure injuries on darkly pigmented skin?
...the JOCN article "Pressure Injuries In People With Darker Skin Tones: A Literature Review?"

Please use the following scale to respond on how strongly you agree with the following statements: (Strongly disagree, disagree, neither disagree or agree, agree, strongly agree)

4. Patients with dark skin tones are at higher risk of developing more severe pressure injuries than patients with light skin tones.
5. Pressure injuries are more likely to be missed when only a visual assessment is conducted.
6. Objective skin tone (light, medium, or dark) is more predictive of skin damage than ethnicity or race.
7. I am comfortable assessing the skin of patients with dark skin tones. Why or why not? (Free text box)
8. I am confident in the terminology for documenting skin assessment findings of patients with dark skin tones. Why or why not? (Free text box)
9. I have not received enough education about nursing care specific to dark skin.
10. I always use touch/tactile assessment when assessing for pressure injuries in patients with dark skin tones.
11. Resources that were shared recently (e.g. resource sheet and video) related to skin assessment on patients with dark skin tone have sparked conversations with my coworkers about caring for this patient population.
12. The video improved my understanding of how to identify abnormal skin assessment findings on patients with dark skin tones.
13. The resource sheet expanded my knowledge about the terminology used to document skin alterations on patients with dark skin tones.
14. The information provided in the video and reference sheet increased my awareness of the pressure injury disparities for patients with dark skin tones.

After viewing the video and reference sheet for the skin assessment and documentation of patients with dark skin tones:

15. What has been the most valuable? (free text box)
16. What surprised you? (free text box)
17. What have you put into practice or plan to put into practice? (free text box)
18. What questions remain about this topic? (free text box)

Appendix I

Project Action Item Progress and Outcomes

	Outcome	Action Item	Approved	Implemented	Evaluated
Professional Outcomes	Awareness, perceptions, beliefs	Create video demonstration of the assessment of a patient with DST.			X
	Training, education Resources and tools	Create a written resource sheet for staff to reference on the assessment and documentation needs of patients with DST.			X
	Competencies	Match the upcoming Wound LDA and nursing assessment flowsheet terminology to the terms and language recommended by current guidelines that are inclusive of darker skin tones.	X		
Organizational Outcomes	Tools, resources, and training	Organizational adoption of an objective skin tone assessment tool (Munsell Color Chart 5YR) within the electronic health record.	X		
	Culture awareness and buy-in	Active engagement and inclusion of organizational leaders and groups.		X	

Appendix J

Pre- and Post-Survey Quantitative Results

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Patients with dark skin tones are at higher risk of developing more severe pressure injuries than patients with light skin tones.					
Pre	0.00%	14.71%	17.65%	54.41%	13.24%
Post	0.00%	0.00%	6.45%	32.26%	61.29%
Pressure injuries are more likely to be missed when only a visual assessment is conducted.					
Pre	1.47%	7.35%	11.76%	51.47%	27.94%
Post	0.00%	0.00%	3.23%	35.48%	61.29%
Objective skin tone (light, medium, or dark) is more predictive of skin damage than ethnicity or race.					
Pre	1.49%	23.88%	35.82%	31.34%	7.46%
Post	0.00%	3.23%	16.13%	41.94%	38.71%
I have been taught how to conduct a skin assessment that accounts for all skin tones.					
Pre	27.94%	44.12%	13.24%	11.76%	2.94%
I have been taught how to identify pressure injuries on all skin tones.					
Pre	25.00%	48.53%	7.35%	17.65%	1.47%
I have been taught terminology to specifically describe skin of patients with dark skin tones.					
Pre	27.94%	60.29%	5.88%	4.41%	1.47%
In my unit/work environment, nurses receive formal training on the skin assessment of patients with dark skin tones.					
Pre	25.00%	67.65%	5.88%	1.47%	0.00%
At UW Health we have resources for assessing the skin of patients with dark skin tones.					
Pre	13.24%	48.53%	23.53%	14.71%	0.00%
At UW Health we have resources for documentation terminology of patients with dark skin tones.					
Pre	13.24%	57.35%	25.00%	4.41%	0.00%
I have not received enough education about nursing care specific to dark skin.					
Pre	0.00%	11.76%	4.41%	55.88%	27.94%
Post	6.67%	40.00%	16.67%	33.33%	3.33%
I always use touch/tactile assessment when assessing for pressure injuries in patients with dark skin tones.					
Pre	1.47%	20.59%	19.12%	50.00%	8.82%
Post	0.00%	10.00%	16.67%	56.67%	16.67%
Current nursing documentation supports everything I want to document regarding my assessment of a patient with dark skin tone.					
Pre	8.82%	35.29%	50.00%	4.41%	1.47%
I am comfortable assessing the skin of patients with dark skin tones.					
Pre	8.96%	53.73%	23.88%	13.43%	0.00%
Post	0.00%	9.68%	12.90%	70.97%	6.45%
I am confident in the terminology for documenting skin assessment findings of patients with dark skin tones.					
Pre	11.94%	65.67%	17.91%	4.48%	0.00%
Post	0.00%	3.33%	20.00%	73.33%	3.33%