

CLINICAL SCHOLARSHIP

Evidence-Based Teaching Strategies for Assessing Pressure Injuries in Older Nursing Home Residents With Darker Skin Tones

¹School of Nursing and Midwifery, Griffith University, Gold Coast Campus, Gold Coast, Queensland, Australia | ²NHMRC Centre of Research Excellence in Wiser Wound Care, Griffith University, Gold Coast Campus, Gold Coast, Queensland, Australia | ³Department of Nursing and Midwifery, Faculty of Allied Health Sciences, General Sir John Kotelawala Defence University, Rathmalana, Sri Lanka | ⁴Department of Para Clinical Sciences, Faculty of Medicine, General Sir John Kotelawala Defence University, Rathmalana, Sri Lanka | ⁵Nursing and Midwifery Education and Research Unit, Gold Coast University Hospital and Health Service, Gold Coast, Queensland, Australia

Correspondence: R D Udeshika Priyadarshani Sugathapala (udeshikasugathapala@griffithuni.edu.au; sugathapala@kdu.ac.lk)

Received: 25 June 2024 | Revised: 12 December 2024 | Accepted: 30 December 2024

Funding: This study was funded by the Griffith University Postgraduate Research Scholarship and the Griffith University International Postgraduate Research Scholarship. The funder of this study had no role in study design, data collection, data analysis, data interpretation, or writing of the report.

Keywords: nurse education | pedagogy | pressure injury | scholarship | skin assessment | training

ABSTRACT

Aim: To describe the development and implementation of evidence-based teaching strategies for assessing and classifying pressure injuries in older nursing home individuals \geq 60 years old with darker skin tones.

Design: Pressure injury assessment learning interventions based on pre- and post-test assessments.

Methods: The learning interventions were developed by experts in pressure injury education and were based on empirical evidence, international clinical practice guidelines, and underpinned by social constructivism theory and the integrated interactive teaching model. The teaching strategy was developed to educate research assistants in the assessment of pressure injuries in darker skin tone individuals. The content included requisite knowledge and skills for pressure injury assessment and classification in darker skinned individuals. Using evidence-based teaching strategies, the content was delivered through face-to-face lectures, small group discussions, and practical application sessions delivered using classroom and practical-based activities. Photographic images were used to assess their knowledge and skills in classifying pressure injuries. Four Bachelor of Nursing-qualified registered nurses in Sri Lanka were recruited as research assistants using the new education resource. Using scores from 1 to 20 points, mastery of the theory and practice components was assessed.

Results: The mean pre-test score was 9 ± 1.6 (95% confidence interval 6.4–11.6), demonstrating that assessment and classification of pressure injury knowledge were lacking. The mean post-test score was 16 ± 0.8 (95% confidence interval 14.7–17.3) indicating an improvement in the participants' ability to assess and staging pressure injuries.

Conclusion: Early pressure injury detection among older individuals with darker skin tones is challenging. This evidence-based teaching approach can be used to educate clinical nurses and research assistants in assessing pressure injuries in individuals with darker skin tones.

Clinical Relevance: This study contributes to the body of knowledge by improving the early detection and accurate classification of pressure injuries in older nursing home residents with darker skin tones, addressing a significant gap in current nursing practice.

This is an open access article under the terms of the Creative Commons Attribution-NonCommercial-NoDerivs License, which permits use and distribution in any medium, provided the original work is properly cited, the use is non-commercial and no modifications or adaptations are made.

© 2025 The Author(s). Journal of Nursing Scholarship published by Wiley Periodicals LLC on behalf of Sigma Theta Tau International.

1 | Introduction

Healthcare-acquired pressure injuries are one of the most frequently occurring and largely preventable complications and quality of care indicator (Sibbald and Ayello 2020). A pressure injury often develops due to unrelieved pressure and can present as non-blanchable intact red skin through to an open ulcer of varying depths. These injuries are classified from Stages I to IV, along with two additional categories: suspected deep tissue injury and unstageable (EPUAP, NPIAP, PPPIA 2019). Nonblanchable erythema, or visible skin redness, is an indication of Stage I pressure injury (EPUAP, NPIAP, PPPIA 2019). The aging process impacts the structure and function of the skin, decreasing its resistance to shearing forces and increasing its vulnerability to insult and damage (Edwards et al. 2017). Older skin is prone to impaired function due to various risk factors, for example, nutrition, hydration, incontinence, and multiple comorbidities, and takes longer to heal once damage does occur (Payne 2020). Delays in the early skin assessment to detect changes due to unrelieved pressure may result in prevention, diagnostic, and intervention latency (Black et al. 2023). Proactive skin assessment is an essential component in mitigating the risk of healthcare-acquired pressure injuries, especially in older adults vulnerable to skin changes and underlying health issues.

Detecting a Stage I pressure injury (non-blanchable erythema) is more difficult among darker skin tone populations because the skin redness is less obvious (Black et al. 2023; Oozageer Gunowa et al. 2018). A narrative review that included 11 original studies on the identification of pressure injuries showed that people with darker skin tones were more likely to develop Stage II or higher pressure injuries because Stage I pressure injuries are under-recognized and under-reported by clinicians (Oozageer Gunowa et al. 2018). There are augmented visual technologies such as sub-epidermal moisture scanners (Moore et al. 2022; O'Brien et al. 2018) and long-wave infrared technology (Simman and Angel 2022) for the early detection of pressure injury; however, these technologies are expensive. Visual skin assessment, which is subjective and inexpensive, is the major strategy nurses implement for detecting and staging pressure injuries (Avello and Delmore 2022). There is a paucity of evidence-based clinical resources that solely focus on skin assessment and pressure injury detection in darker skinned individuals. Hence, there is a critical need to address the knowledge and skills gap in pressure injury assessment within nursing homes.

Pressure injury prevention and management require a collaborative healthcare team effort, with nurses primarily responsible for assessment and prevention. Results of a descriptive, comparative multicenter study conducted in Sweden (Gunningberg et al. 2015) suggest that pressure injury assessment and staging skills were low for registered nurses (mean score for classification and observation: 55.8%) and undergraduate nursing students (mean score for classification and observation: 54.3%) using the pressure injury knowledge assessment tool, compared to the other themes. For example, the etiology and causes of pressure injury (64.4%; 66.4%), risk assessment (76.0%; 79.9%), and nutrition (81.1%; 91.8%). The overall mean score for knowledge was 49.9% (11.7/26) among student nurses in Turkey when assessed with the pressure ulcer knowledge assessment

tool (Kara, Arikan, and Kahyaoglu 2021) and this tool has been used to identify unmet needs and reasons for low pressure injury knowledge (Ayello et al. 2017; Kara, Arikan, and Kahyaoglu 2021). Also, most teaching resources were predominantly developed for assessing pressure injury in Caucasian skin (Black et al. 2023; Pusey-Reid et al. 2023). Assessing dark skin tones requires additional attention when using resources primarily designed for fair skin tones. Recent studies on skin tone diversity (from fair to dark skin tones) and pressure injuries in undergraduate nursing education have highlighted an urgent need for curricula to include comprehensive information on this topic (Oozageer Gunowa et al. 2020; Oozageer Gunowa et al. 2021). Therefore, designing and developing an evidencebased teaching strategy to assess and classify pressure injuries using visual skin assessments in darkly pigmented skin is an ideal solution for this existing gap.

The overarching aim of this paper was to describe the development and implementation of evidence-based teaching strategies that aid nurses in conducting skin assessments and classifying pressure injuries in older nursing home individuals \geq 60 years old with darker skin tones.

2 | Methods

2.1 | Study Design

The pressure injury teaching strategies were underpinned by social constructivism (Vygotsky 1978), which is an adult learning theory and an integrated interactive teaching model (Khan and Coomarasamy 2006). The social constructivism theory suggests that individual's learning is heavily dependent on interpersonal interaction and discussion, with the primary focus on the students' understanding of the discussion. The student is actively learning through interaction with peers and teachers. The teacher is facilitating and stimulating the conversation by harnessing the natural flow of conversation in the classroom (Vygotsky 1978). The integrated interactive teaching model suggests a hierarchy of evidence-based teaching and learning in medicine, which has three levels according to the interaction of the students and teachers integrated with the clinical settings (Khan and Coomarasamy 2006). Most of the teaching strategies, for example, dedicated time for interpersonal interactions and discussion, prompts for stimulating the conversations, and hands-on practice, were incorporated into educational assessment and classification of pressure injuries as guided by the social constructivism theory and the integrated interactive teaching model.

2.2 | Designing and Developing Evidence-Based Teaching Strategies

Through evidence-based teaching strategies, the purpose was to develop research nurses' competency to accurately assess, identify, and stage pressure injuries among older individuals with darker skin tones. The content was based on empirical evidence, international pressure injury clinical practice guidelines, and pedagogy literature (Ham et al. 2015; Stankiewicz et al. 2016). First, a content outline, learning objectives, and

delivery approach were considered and designed based on the availability of local Sri Lankan resources, such as access to technology. A team of experienced wound care specialists and academics independently judged the content and the congruence of pre and post-test items with the learning objectives. The primary learning outcome was to conduct a visual skin assessment to correctly identify a pressure injury. This included the definition and etiology of pressure injury, risk factors, the differences between pressure injury and other skin injuries, pressure injury identification using visual skin assessment, and the common anatomical locations at risk for pressure injury. An important outcome was the classification of pressure injuries according to international clinical practice guidelines (EPUAP, NPIAP, PPPIA 2019). These guidelines provide evidence-based recommendations from academic and clinical experts from 12 countries for the prevention and treatment of pressure injuries, intended for use by health professionals, patients, and informal caregivers. Laminated photographic illustrations of the pressure injury classification system, from Stages I to IV, suspected deep tissue injury and un-stageable, for fair and darker skin tones, adults and older adults published by the Pan Pacific Pressure Injury Classification System for Darker Skin Tones (2020) was used in the interactive session.

Skin inspection should be undertaken with an awareness of skin tone (Black et al. 2023). Understanding the range of skin tones enhances the accurate identification and classification of a pressure injury because it is difficult to identify non-blanchable erythema in darkly pigmented skin. There are many skin tone assessment tools available, such as the Fitzpatrick classification, the Munsell color chart, and the skin tone tool (Ho and Robinson 2015). The Fitzpatrick classification (Fitzpatrick 1988), an important component of this education program, is a widely used method of skin phototyping (pale white skin, white skin, light brown skin, moderate brown skin, dark brown skin, and deeply pigmented dark brown to black skin). The first signs of a pressure injury include changes in skin color such as redness, darkening, lightening, or gray/blue/purple tones. In addition, as inflammation under the skin and within the tissue increases, the skin may feel tight, spongy, or appear shiny. Also, there may be a change in temperature; skin feels cold or hot, pain, or numbness over the affected area. These factors should be assessed when detecting pressure injuries (EPUAP, NPIAP, PPPIA 2019). Table 1 details the teaching outline.

The design and development of this teaching strategy was based on socio-cultural constructivism by Vygotsky (1978),

TABLE 1 | Teaching outline.

Section	Description
Aim	To develop the research assistant's competency in conducting a skin assessment using visual skin assessment, identify and correctly classify any pressure injury in older individuals with darker skin tones residing in nursing homes
Learning outcomes	By the end of the session, participants will: • Develop knowledge and skills in visual skin assessment of an older person with darker skin tones adhering to ethical principles • Identify a pressure injury in individuals with darker skin tones using the visual skin assessment • Demonstrate skills in classifying pressure injuries using the international
Content areas	classification system • Anatomy of the skin (aging skin) • Etiology of pressure injuries • Assessment of pressure injury risk factors • Staging of pressure injury and identification of other wound types • Assessment of different skin tones (using Fitzpatrick scale) • Visual skin assessment, identifying at-risk anatomical locations and assessing
	difficult skin types (darker skin, older adults) • Ethical considerations of pressure injury research (case scenarios)
Teaching and learning strategies	Teaching and learning activity (time allocation)
	Lectures (2h)
	Group activities (1 h)
	Case scenario discussions (1 h)
	Clinical application (1 h completed on older adults in the nursing homes)
Assessment and evaluation	Pre-test; at the beginning of the training (40 min) (formative)
	Post-test; after the training (40 min) (summative)
Summary	A summary of the content; link to further learning

where the learner iteratively builds skills and knowledge through social interaction with peers and teachers and social activities—for example, interactive small group work and case scenario discussions. Various teaching methods are used in the delivery of evidence-based nursing practice. We adopted the integrated interactive teaching model, which includes a clear hierarchy of educational activities described as Level 1 and Level 2(a) and 2(b). Level 1 activities are interactive and closely tied to clinical practice, while Level 2(a) involves interactive classroom sessions, and Level 2(b) focuses on didactic activities that are still clinically integrated (Khan and Coomarasamy 2006). Most evidence-based nursing teaching activities fall into Level 2, where teaching is located in both the classroom and clinical settings. Our sessions included scaffolded lectures, small group discussions based on case scenarios, and interactive learning. Furthermore, we focused on integrating evidence into clinical practice through the active participation of learners in the real-world (naturalistic) setting. This was achieved by visualizing the pressure injury stages and different skin tones through flashcards and validated photos, which are available in the PPPIA resources (Pan Pacific Pressure Injury Classification System for Darker Skin Tones 2020). Incorporating the integrated interactive teaching model provided a structured approach to learning and ensured the seamless incorporation of evidence-based nursing practice into real-world clinical settings.

2.3 | Sampling

The evidence-based teaching strategies were developed to aid the training of research assistants prior to data collection in another prospective cohort study on pressure injury among older people in Sri Lankan nursing homes. As in other countries, research assistants can undertake a wide variety of "tasks" under the direction of the research team. In the case of our study, they were hired and trained as data collectors, which included assessment of the pressure injury outcome. The outcome of the teaching strategy was to build competency in conducting a visual skin assessment and to identify and correctly classify any pressure injury in older individuals with darker skin tones residing in nursing homes. Four nurses with BSc (Hons) Nursing and registered as general nurses in Sri Lanka were recruited as research assistants. In the Sri Lankan health context, geriatric nursing is not a well-developed specialty. Only a small number of student nurses in Sri Lanka enroll in geriatric nursing training, which is an elective module of the undergraduate nursing programs offered by seven public universities, each with its own distinct curriculum (Rathnayake, Athukorala, and Siop 2016). Generally, during the 4-year Bachelor of Nursing degree program in Sri Lanka, undergraduates learn about pressure injuries, etiology, risk factors, and preventive measures in the fundamentals of nursing module. However, the amount of information on the classification of pressure injuries in relation to older people with darker skin tones, signs, and symptoms of early detection of pressure injury, for example, changes to skin temperature, texture, and color apart from non-blanchable erythema, is suboptimal. Even though they have knowledge about pressure injuries, any new knowledge that will build upon their previous knowledge, also known as scaffolding, is essential.

2.4 | Summative and Formative Evaluation

The effectiveness of teaching and learning activities can be measured through formative and summative evaluation (Mukhalalati and Taylor 2019). The outcomes can be related to the learner (nurses). An important first step in evidence-based teaching is to evaluate the learners' prior knowledge and skills. This evaluation helps teachers to gain a baseline and identify any additional education gaps. Furthermore, using formative evaluation, teachers can adjust teaching strategies to scaffold the content to meet the needs of individual learners. We used a formative pre-test and a summative post-test, enabling the teacher to assess any changes in knowledge or skill.

Our evidence-based teaching strategies were based on the six-step BOPPPS model (Hu et al. 2022; Wen et al. 2023): bridge-in, objective, pre-assessment, participatory learning, post-assessment, and summary (Wen et al. 2023). The bridge-in connected the importance of pressure injury assessment to their prior nursing knowledge, while clear objectives provided direction for their learning. Pre-assessment identified initial gaps, which informed the participatory activities that followed. Through interactive sessions, the research assistants engaged with the teacher through diverse case studies and practical examples, enriching their understanding and skills. Post-assessment results demonstrated significant knowledge gains, and the summary sessions reinforced their learning, ensuring that the new skills and knowledge were firmly embedded. This teaching model focuses on studentcentered approaches and significantly increases the effectiveness of teaching and learning (Li et al. 2023; Wen et al. 2023). This approach is based on constructivism and a communicative approach that emphasizes students' participatory interaction and feedback (Hu et al. 2022).

2.5 | Ethical Approval

Prior to implementation, ethics approval was obtained from the Ethics Review Committee, Faculty of Medicine, General Sir John Kotelawala Defence University, Sri Lanka (RP/2023/09) and the Griffith University Human Research Ethics Committee, Australia (2023/420).

3 | Results

3.1 | Delivery of Teaching Strategies

This pressure injury teaching outline was delivered by the first author, who is a senior nursing lecturer and has extensive experience in undergraduate education. Delivery of teaching commenced with a bridge-in session, which connects content to learners' current knowledge and best practice while gaining their attention and "readiness to learn." Open-ended questions such as "Tell me what you know about pressure injury?" and "Describe your experience of undertaking pressure injury assessment?" were used. Prior knowledge about pressure injury identification and staging was assessed by a pre-test prior to any content delivery. The pre-test included 10 multiple-choice

questions with a single best answer among several options presented. This test measured knowledge on the assessment of darkly pigmented skin, pressure injury identification, and staging and risk factors. The research team, who have extensive experience in pressure injury research and tertiary education, developed the test based on the international clinical practice guidelines (EPUAP, NPIAP, PPPIA 2019). This increased the face and content validity of the test and met the aim of testing participants' prior content knowledge. The research team developed 10 images of wound types and pressure injuries, specifically focused on darkly pigmented skin. These researcher-made images, validated by experienced wound care researchers, were included to assess skills in identifying pressure injuries and accurately staging them according to clinical practice guidelines (EPUAP, NPIAP, PPPIA 2019). The pre-test included 20 items with a total possible score of 20. The pre- and post-tests, being based on the same questions and administered in the same groups under the same conditions, ensured the reliability of scores.

Theoretically, adult learners are internally motivated and have a self-learning plan that identifies the goals they need to achieve (Spies, Seale, and Botma 2015). As shown in Table 1, the objectives were clearly defined and articulated to the learners, including the delivery time frame and methods of evaluation. Subsequently, the content was delivered using lectures, small group discussions, and case scenario discussions. The teacher explained the epidemiology of pressure injuries and their burden on residents, nurses, management of nursing homes, and the healthcare system. This was linked to how nurses can improve residents' quality of life and reduce the additional costs associated with lower pressure injury rates within the institution. A PowerPoint presentation was used as the teaching aid. Case scenarios were used to illustrate the ethical considerations associated with pressure injury assessment. For example, obtaining informed consent, maintaining privacy, confidentiality, responsibility, and accountability (Choo, Blundell, and McGinnis 2012) were used. Using case scenarios has been shown to influence the affective domain of learning (Baracho, Chaves, and Lucas 2020), which may positively influence a behavior change in the clinical setting. Finally, an opportunity was given for participants to practice after a demonstration at the nursing home setting by the teacher. Each participant performed a skin assessment on nursing home residents who consented to participate in the cohort study and had the opportunity to assess and classify pressure injuries in the nursing home setting. The sessions were interactive and applied to the clinical setting. During this practice, the teacher reviewed and discussed with the students their assessments of individual residents, but these interactions were not formally evaluated; instead, they were used to explore issues and reinforce learning.

The teacher determines whether the objectives were achieved through formative or summative evaluation (Mukhalalati and Taylor 2019). The teacher asked open- and closed-ended questions as part of a formative assessment of the learners' knowledge and ability to understand the content. To evaluate whether learning and understanding occurred, a post-test was conducted, using the same questions assessed in the pre-test, as a summative assessment. In the final stage of the training,

the teacher used a flowchart to assist students in summarizing the content and linking it to the subsequent steps in their future learning journey.

3.2 | Clinical Application of Program Content

We used our evidence-based teaching strategies to train four research assistants who were registered nurses with Bachelor of Nursing qualifications. Prior to the delivery of any content, we conducted a pre-test. The pre-test score ranged from 7 to 11 out of 20. The mean pre-test score was 9 ± 1.6 (95% confidence interval 6.4-11.6) with identification, assessment, and classification into different stage areas of pressure injury knowledge lacking. The mean post-test score was 16 ± 0.8 (95% confidence interval 14.7-17.3) with a minimum score of 15 of 20 and a maximum score of 17 of 20, indicating an improvement in the ability of research nurses to identify and staging pressure injuries among this small sample (Figure 1). Post-training evaluations demonstrated a marked improvement in their proficiency. The mean post-test score rose to 16 ± 0.8 , with a much narrower 95% confidence interval of 14.7-17.3, highlighting a consistent enhancement in their skills across the group. This substantial increase in scores signifies that the teaching strategies were effective in equipping the research nurses with the necessary knowledge and abilities to accurately identify and stage pressure injuries.

4 | Discussion

This evidence-based teaching approach was designed and delivered using empirical pressure injury evidence and underpinned by educational theories. Integration of learning theories and subject matter to improve student learning is important in nursing education because it improves the link between theory and practice (Mukhalalati and Taylor 2019). We utilized socio-cultural constructivism by Vygotsky (1978), the integrated interactive teaching model (Khan and Coomarasamy 2006) and the BOPPPS model (Hu et al. 2022) for the development and implementation of these teaching strategies. An advantage of using Vygotsky's constructive theory was that teachers initially delivered small sections of information, checked for learning, and then demonstrated tasks. This was followed by providing support to facilitate the

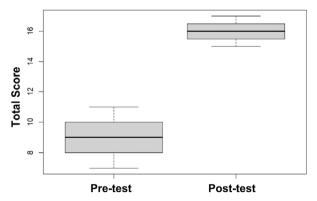


FIGURE 1 | Pre- and post-test scores.

408

learner's independent practice and competence in the task. According to the student-centered learning approach used, the BOPPPS method (Li et al. 2023), when learners are encouraged to ask questions, and answers are discussed with the whole group, including their peers, this enables them to develop new knowledge and skills. Therefore, it is suitable for training nurses for research and clinical contexts.

The content was underpinned by pressure injury clinical practice guidelines (EPUAP, NPIAP, PPPIA 2019) and a validated skin tone tool (Fitzpatrick 1988). The opportunity to practice using both white and dark skin tones photographic illustrations of the pressure injury classification system enabled the learners to increase their assessment knowledge and skills, as reflected in participants' higher post-test scores. Evaluation of the pre- and post-test scores showed that the trainee research assistants improved their skin assessment knowledge and skills after the delivery of the education program. This was achieved through interactions with the teacher, peers, community, the classroom, and nursing home as environmental contexts, which are main facilitators of social learning theory (Mukhalalati and Taylor 2019). This comprehensive approach to training, grounded in established clinical guidelines and enhanced through practical application and social learning, effectively bridges theoretical knowledge and clinical practice, significantly improving the competence and confidence of healthcare professionals in pressure injury assessment.

Finally, the most important component of the evidence-based teaching strategies program was the opportunity to develop the research assistants' competency in a real-world setting. Most other curricula undertake this training in the clinical lab or simulation setting (Koukourikos et al. 2021). Some suggest that a clinical scenario simulation approach is more effective than employing the traditional lecturing method for cultivating students' assessment ability regarding pressure injuries (Yan-Li et al. 2021). Therefore, the competency assessment and feedback with actual older nursing home residents might increase the research assistants' clinical competence. This hands-on approach allowed for direct application of theoretical knowledge, fostering a deeper understanding and proficiency that is often limited or unattainable in controlled simulation environments. Furthermore, the immediate feedback and competency assessments that they received from working in these authentic contexts enabled them to rapidly identify areas for improvement and refine their techniques.

Our evidence-based education program addresses the existing gap in training programs focused on skin tone diversity, although we accept that there are some limitations. We implemented this with a small number of nurses, so it is limited in its ability to draw accurate conclusions about its effectiveness. Several authors have discussed that their training programs had a positive impact on participants' knowledge of pressure injuries among participants (Karimian et al. 2020; Wu et al. 2022). However, those results could not be compared, due to our smaller sample size and single education institution. Implementing this program for a larger group of learners is recommended for the future. Secondly, using the same items for both our pre-test and post-test may have helped

learners discover the correct answers during the session, even if they were unsure of them during the pre-test. If we had used a different set of questions and images for the post-test, we may have avoided this issue. Finally, we did the post-test on the same day as the teaching, meaning we did not measure the retention of knowledge among participants.

4.1 | Implications for Practice

Although our education program was delivered to a few research assistants, it can be used to teach nursing home staff members, for example, nurses and caregivers. Education of nurses enhances the quality of care toward patients and has an impact on the nurse's self-development through lifelong learning. Previous pressure injury education programs focused on the prevention and management of pressure injuries among nursing home residents (Lee, Kwon, and Chang 2022) and critically ill patients (Karimian et al. 2020). Different educational tools have been utilized for the identification of pressure injuries for emergency nurses and outcome assessors (Ham et al. 2015; Stankiewicz et al. 2016). Nonetheless, our evidence-based teaching strategies program provides a novel approach to identifying and classifying pressure injuries in darker skin-toned elderly residents. This program can be used as a continuous professional development program for nurses and carers currently working with this vulnerable population. Furthermore, meticulously crafted training aimed at enhancing the skills of nurses could serve as a standalone component within nursing curricula. This is especially relevant in cases where the topic area of "pressure injury" is currently fragmented across various modules such as fundamentals of nursing, surgical nursing, adult nursing, and geriatric nursing.

Pressure injuries in individuals with darker skin tones are under-recognized and under-reported. So, integrating this evidence-based teaching strategy into the existing healthcare framework can contribute to the early identification of Stage I pressure injuries in darker skin tone individuals. Identification of Stage I pressure injuries increases the opportunity to reverse any further skin damage and improve the quality of care provided across different settings. Pressure injury healing is an integral component of an older individual's total healing and possibly returning home, as well as reducing care-associated costs (Sezgin et al. 2024). By incorporating advanced training focused on the nuances of pressure injury identification in individuals with darker skin tones, healthcare institutions can bridge the knowledge gap and reduce disparities in patient outcomes. Additionally, the teaching strategy's adaptability allows it to be customized for various levels of expertise, ensuring that both novice and experienced nurses can benefit from the material. This flexibility promotes a culture of continuous improvement and responsiveness to the evolving needs of the patient population. Institutional support for the implementation of this teaching strategy can also foster a collaborative learning environment, encouraging interprofessional dialogue and shared best practices. Ultimately, the widespread adoption of this specialized evidence-based teaching strategy holds the potential to elevate the overall standard of care, ensuring that all patients receive equitable and effective treatment.

5 | Conclusion

Prevention of pressure injuries includes skin and soft tissue assessment. Early pressure injury detection among persons with darker skin tones is challenging. With advancing age, like all other organs, skin integrity decreases; therefore, it is important to assess the skin and identify pressure injuries as early as possible. Visual skin assessment is the most frequently used and accessible assessment tool. Thus, an emphasis on staff education programs that increase the knowledge and practice of visual skin assessment is needed. Most tools currently used are based on the evidence from persons with white skin tones. Hence, we developed an evidence-based teaching strategy to assess and classify pressure injuries among older people with dark skin tones. After the implementation, the four research assistants increased their knowledge and skills in pressure injury identification, staging, and classification. In conclusion, the tailored teaching strategy addressing the unique challenges of pressure injury detection in individuals with darker skin tones has shown promising results. However, to validate these findings and ensure the initial finding's broader applicability, future research should involve a larger sample size.

6 | Clinical Resources

Pan Pacific Pressure Injury Classification System for Darker Skin Tones. (2020). Pan Pacific Pressure Injury Alliance (PPPIA). https://pppia.org/static/pdfs/pppia-classification-syste m-dark-skin-tones.pdf.

Skin Assessment: Assessing skin on patients with darker skin tones in relation to PU prevention. https://societyoftissueviability.org/resources/skin-assessment-assessing-skin-on-patients-with-darker-skin-tones-in-relation-to-pu-prevention/.

Wounds UK. (2021). Best Practice Statement: Addressing skin tone bias in wound care: assessing signs and symptoms in people with dark skin tones. Wounds UK, London. https://www.wounds-uk.com/resources/details/addressing-skin-tone-bias-wound-care-assessing-signs-and-symptoms-people-dark-skin-tones.

Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

References

Ayello, E. A., and B. A. Delmore. 2022. "Risk Assessment for Pressure Injuries." *World Council of Enterostomal Therapists Journal—Chinese Edition* 42, no. 4: 31–37. https://doi.org/10.33235/wcet.42.4.31-37.

Ayello, E. A., K. Zulkowski, E. Capezuti, W. H. Jicman, and R. G. Sibbald. 2017. "Educating Nurses in the United States About Pressure Injuries." *Advances in Skin & Wound Care* 30, no. 2: 83–94. https://doi.org/10.1097/01.ASW.0000511507.43366.a1.

Baracho, V. D. S., M. E. A. Chaves, and T. C. Lucas. 2020. "Application of the Educational Method of Realistic Simulation in the Treatment of Pressure Injuries." *Revista Latino-Americana de Enfermagem* 28: e3357. https://doi.org/10.1590/1518-8345.3946.3357.

Black, J., J. Cox, V. Capasso, et al. 2023. "Current Perspectives on Pressure Injuries in Persons With Dark Skin Tones From the National Pressure Injury Advisory Panel." *Advances in Skin & Wound Care* 36, no. 9: 470–480. https://doi.org/10.1097/ASW.0000000000000032.

Choo, J., S. Blundell, and E. McGinnis. 2012. "Ethical Issues and Challenges in Pressure Ulcer Research—the Research Nurses' Perspective." *Journal of Tissue Viability* 21, no. 4: 105–108. https://doi.org/10.1016/j.jtv.2012.08.002.

Edwards, H. E., A. M. Chang, M. Gibb, et al. 2017. "Reduced Prevalence and Severity of Wounds Following Implementation of the Champions for Skin Integrity Model to Facilitate Uptake of Evidence-Based Practice in Aged Care." *Journal of Clinical Nursing* 26, no. 23–24: 4276–4285. https://doi.org/10.1111/jocn.13752.

European Pressure Ulcer Advisory Panel. 2019. "National Pressure Injury Advisory Panel and Pan Pacific Pressure Injury Alliance. Prevention and Treatment of Pressure Ulcers/Injuries: Clinical Practice Guideline. The International Guideline. E. Haesler. EPUAP/NPUAP/PPIA." https://internationalguideline.com/.

Fitzpatrick, T. B. 1988. "The Validity and Practicality of Sun-Reactive Skin Types I Through VI." *Archives of Dermatology* 124, no. 6: 869–871. https://doi.org/10.1001/archderm.124.6.869.

Gunningberg, L., G. Mårtensson, A. G. Mamhidir, J. Florin, Å. Muntlin Athlin, and C. Bååth. 2015. "Pressure Ulcer Knowledge of Registered Nurses, Assistant Nurses and Student Nurses: A Descriptive, Comparative Multicentre Study in Sweden." *International Wound Journal* 12, no. 4: 462–468. https://doi.org/10.1111/iwj.12138.

Ham, W. H., L. Schoonhoven, M. J. Schuurmans, R. Veugelers, and L. P. Leenen. 2015. "Pressure Ulcer Education Improves Interrater Reliability, Identification, and Classification Skills by Emergency Nurses and Physicians." *Journal of Emergency Nursing* 41, no. 1: 43–51. https://doi.org/10.1016/j.jen.2014.03.005.

Ho, B. K., and J. K. Robinson. 2015. "Color Bar Tool for Skin Type Self-Identification: A Cross-Sectional Study." *Journal of the American Academy of Dermatology* 73, no. 2: 312–313. https://doi.org/10.1016/j.jaad.2015.05.024.

Hu, K., R.-J. Ma, C. Ma, Q.-K. Zheng, and Z.-G. Sun. 2022. "Comparison of the BOPPPS Model and Traditional Instructional Approaches in Thoracic Surgery Education." *BMC Medical Education* 22, no. 1: 447. https://doi.org/10.1186/s12909-022-03526-0.

Kara, H., F. Arikan, and A. Kahyaoglu. 2021. "Student Nurse Knowledge of and Attitudes Toward Pressure Injury Prevention: How Sufficient Is Undergraduate Education?" *Advances in Skin & Wound Care* 34, no. 9: 473–480. https://doi.org/10.1097/01.ASW.0000767332.40833.28.

Karimian, M., E. Khalighi, E. Salimi, M. Borji, A. Tarjoman, and Y. Mahmoudi. 2020. "The Effect of Educational Intervention on the Knowledge and Attitude of Intensive Care Nurses in the Prevention of Pressure Ulcers." *International Journal of Risk & Safety in Medicine* 31, no. 2: 89–95. https://doi.org/10.3233/JRS-191038.

Khan, K. S., and A. Coomarasamy. 2006. "A Hierarchy of Effective Teaching and Learning to Acquire Competence in Evidenced-Based Medicine." *BMC Medical Education* 6: 59. https://doi.org/10.1186/1472-6920-6-59.

Koukourikos, K., A. Tsaloglidou, L. Kourkouta, et al. 2021. "Simulation in Clinical Nursing Education." *Acta Informatica Medica* 29, no. 1: 15–20. https://doi.org/10.5455/aim.2021.29.15-20.

Lee, Y. A.-O., D. Y. Kwon, and S. A.-O. Chang. 2022. "Bridging the Knowledge Gap for Pressure Injury Management in Nursing Homes." *International Journal of Environmental Research and Public Health* 19, no. 3: 1400. https://doi.org/10.3390/ijerph19031400.

Li, Z., X. Cai, K. Zhou, et al. 2023. "Effects of BOPPPS Combined With TBL in Surgical Nursing for Nursing Undergraduates: A Mixed-Method Study." *BMC Nursing* 22, no. 1: 133. https://doi.org/10.1186/s12912-023-01281-1.

Moore, Z., N. L. McEvoy, P. Avsar, et al. 2022. "Measuring Subepidermal Moisture to Detect Early Pressure Ulcer Development: A Systematic Review." *Journal of Wound Care* 31, no. 8: 634–647. https://doi.org/10.12968/jowc.2022.31.8.634.

Mukhalalati, B. A., and A. Taylor. 2019. "Adult Learning Theories in Context: A Quick Guide for Healthcare Professional Educators." *Journal of Medical Education and Curricular Development* 6: 2382120519840332. https://doi.org/10.1177/2382120519840332.

O'Brien, G., Z. Moore, D. Patton, and T. O'Connor. 2018. "The Relationship Between Nurses Assessment of Early Pressure Ulcer Damage and Sub Epidermal Moisture Measurement: A Prospective Explorative Study." *Journal of Tissue Viability* 27, no. 4: 232–237. https://doi.org/10.1016/j.jtv.2018.06.004.

Oozageer Gunowa, N., J. Brooke, M. Hutchinson, and D. Jackson. 2020. "Embedding Skin Tone Diversity Into Undergraduate Nurse Education: Through the Lens of Pressure Injury." *Journal of Clinical Nursing* 29, no. 21–22: 4358–4367. https://doi.org/10.1111/jocn.15474.

Oozageer Gunowa, N., M. Hutchinson, J. Brooke, H. Aveyard, and D. Jackson. 2021. "Pressure Injuries and Skin Tone Diversity in Undergraduate Nurse Education: Qualitative Perspectives From a Mixed Methods Study." *Journal of Advanced Nursing* 77, no. 11: 4511–4524. https://doi.org/10.1111/jan.14965.

Oozageer Gunowa, N., M. Hutchinson, J. Brooke, and D. Jackson. 2018. "Pressure Injuries in People With Darker Skin Tones: A Literature Review." *Journal of Clinical Nursing* 27, no. 17–18: 3266–3275. https://doi.org/10.1111/jocn.14062.

Pan Pacific Pressure Injury Classification System for Darker Skin Tones. 2020. "Pan Pacific Pressure Injury Alliance (PPPIA)." https://pppia.org/static/pdfs/pppia-classification-system-dark-skin-tones.pdf.

Payne, D. 2020. "Skin Integrity in Older Adults: Pressure-Prone, Inaccessible Areas of the Body." *British Journal of Community Nursing* 25, no. 1: 22–26.

Pusey-Reid, E., L. W. Quinn, J. Wong, and A. Wucherpfennig. 2023. "Representation of Dark Skin Tones in Foundational Nursing Textbooks: An Image Analysis." *Nurse Education Today* 130: 105927. https://doi.org/10.1016/j.nedt.2023.105927.

Rathnayake, S., Y. Athukorala, and S. Siop. 2016. "Attitudes Toward and Willingness to Work With Older People Among Undergraduate Nursing Students in a Public University in Sri Lanka: A Cross Sectional Study." *Nurse Education Today* 36: 439–444. https://doi.org/10.1016/j.nedt. 2015.10.007.

Sezgin, D., M. Petrovic, M. Canavan, et al. 2024. "Prevention of Pressure Ulcers From the Perspective of Frailty, Pre-Frailty, and Health and Social Inequalities: An Opinion Paper." *Journal of Tissue Viability* 33: 701–705. https://doi.org/10.1016/j.jtv.2024.07.006.

Sibbald, R. G., and E. A. Ayello. 2020. "Terminal Ulcers, SCALE, Skin Failure, and Unavoidable Pressure Injuries: Results of the 2019 Terminology Survey." *Advances in Skin & Wound Care* 33, no. 3: 137–145. https://doi.org/10.1097/01.Asw.0000653148.28858.50.

Simman, R., and C. Angel. 2022. "Early Identification of Deep-Tissue Pressure Injury Using Long-Wave Infrared Thermography: A Blinded Prospective Cohort Study." *Advances in Skin & Wound Care* 35, no. 2: 95–101. https://doi.org/10.1097/01.ASW.0000790448.22423.b0.

Spies, C., I. Seale, and Y. Botma. 2015. "Adult Learning: What Nurse Educators Need to Know About Mature Students." *Curationis* 38, no. 2: 1494. https://doi.org/10.4102/curationis.v38i2.1494.

Stankiewicz, M., J. Webster, M. Wallis, M. Tallot, and W. Chaboyer. 2016. "An Education Program for Pressure Injury Recognition and

Assessment Utilising Constructivism Teaching Method." *Wound Practice and Research* 24: 2. https://journals.cambridgemedia.com.au/wpr/volume-24-number-2/education-program-pressure-injury-recognition-and-assessment-utilising-constructivism-teaching-method.

Vygotsky, L. 1978. "Interaction Between Learning and Development." *Readings on the Development of Children* 23: 34–41.

Wen, H., W. Xu, F. Chen, et al. 2023. "Application of the BOPPPS-CBL Model in Electrocardiogram Teaching for Nursing Students: A Randomized Comparison." *BMC Medical Education* 23: 987. https://doi.org/10.1186/s12909-023-04983-x.

Wu, J., B. Wang, L. Zhu, and X. Jia. 2022. "Nurses' Knowledge on Pressure Ulcer Prevention: An Updated Systematic Review and Meta-Analysis Based on the Pressure Ulcer Knowledge Assessment Tool." *Frontiers in Public Health* 10: 964680. https://doi.org/10.3389/fpubh. 2022.964680.

Yan-Li, D., M. Chun-Hua, L. Yu-Feng, W. Lu, Z. Ya, and N. Geng. 2021. "Is Clinical Scenario Simulation Teaching Effective in Cultivating the Competency of Nursing Students to Recognize and Assess the Risk of Pressure Ulcers?" *Risk Management and Healthcare Policy* 14: 2887–2896. https://doi.org/10.2147/RMHP.S315138.