DOI:
10.12968/bjon.2024.33.4.176

Document Version
Peer reviewed version

Title:
What influences the inclusion of skin tone diversity when teaching skin assessment? : Findings from a mixed methods online survey of nurse educators in practice and universities.

Abstract:

Background: Understanding the variances in visual skin changes across all skin tones is important to clinical care. However, the experiences of those teaching skin assessment to pre- and post- nurse registrants are unknown.
Aims: To determine the barriers and facilitators experienced in teaching skin assessment across a range of skin tones to pre- and post- nurse registrants.
Methods: A cross-sectional, mixed methods online survey was undertaken throughout February and March 2023 based on the Theoretical Domains Framework of behaviour change.
Findings: In this self-selecting sample of people, most participants were aware of why it was important to include all skin tones when teaching skin assessment and were professionally motivated to include this in their practice. However, resources and support are needed to overcome an unconscious bias in teaching skin tone diversity resulting in a lack of availability of good quality photographs and educator confidence in their own skills. Educators not considering skin tone when selecting patient cases and relying on people with dark skin tones to highlight where practice is not inclusive may also lead to insufficient exposure.
Conclusion: There is some awareness of the importance of including diverse skin tones in teaching, but further education and resources are needed.

Keywords:

Skin pigmentation
Education, Nursing
Nursing assessment
Physical Examination
Diversity, Equity, Inclusion

Reflective questions:

- Reflect on the key components of skin assessment - how confident do you feel to conduct a skin assessment encompassing patient history taking, observation and palpation?
- How do you include patients with dark skin tones and their families in understanding and recognising skin changes that occur from a variety of conditions encountered in your practice?
- How do you include people with dark skin tones when teaching students or colleagues about skin assessment in your practice? Could this be improved?

- How could you influence other colleagues to improve their skin assessment of people with dark skin tones in your clinical area?

Key Points:

- The need to include diverse skin tones in teaching skin assessment is recognised as important.
- Many nurses who teach skin assessment lack the confidence to include assessment of people with dark skin tones.
- Historic unconscious bias has led to a lack of resources for teaching skin assessment in people with dark skin tones (e.g. copyright free images).
- Efforts to treat everyone equally results in colour-blindness in teaching leading to knowledge gaps in skin assessment of people with dark skin tones.

1. Introduction

Visual signs of tissue damage caused by pressure, moisture, infection and vascular conditions of the lower limb may be missed in people with dark skin tones due to variances in the presentation of skin changes across skin tones (Wounds UK, 2021). A skin assessment that includes palpating the patients' skin to assess for temperature and skin turgor, and discussing skin symptoms and skin changes with the patient is essential to underpin diagnosis in people with dark skin tones rather than just relying on visual inspection alone (Dhoonmoon *et al.*, 2023). Inability to undertake an accurate skin assessment across all skin tones negatively affects people with dark skin as early signs of tissue damage are missed and differential diagnoses are inaccurate. This is exemplified in pressure ulcers where people with dark skin tones are more likely to present with severe pressure ulceration than their counterparts with lighter skin tones (Oozageer Gunowa *et al.*, 2018; Bates-Jensen *et al.*, 2021).

Nurses acquire skills in assessing patients' skin on clinical placements or through experiential learning as a registrant (Gray *et al.*, 2019) where there is variation in exposure to diverse skin tones and clinical language is focused on light skin tones (Oozageer Gunowa *et al.*, 2021). Nurse education on skin assessment outside of the practice setting is predominantly focused on people with light skin tones (Oozageer Gunowa *et al.*, 2021), which may be attributed to skin tone diversity not being included in European standards of wound education (Holloway *et al.*, 2020) or UK standards of proficiency (Nursing and Midwifery Council, 2018). However, little is known about the experiences of those teaching skin assessment to pre- and post-nurse registrants, and the barriers or facilitators that lead educators to include skin tone diversity within their teaching of skin assessment.

2. Aims and Objectives.

This study aimed to explore the experiences of people involved in teaching skin assessment to pre- and post- nurse registrants in both clinical and higher education settings to identify the barriers and facilitators in teaching skin and tissue assessment of patients with a range of skin tones.

3. Method

3.1 Study design

A cross-sectional online survey was undertaken of people involved in teaching skin assessment to pre- and post- nurse registrants. It is reported using the internationally developed "Checklist for Reporting of Survey Studies" (CROSS) (Sharma *et al.*, 2021) with additional information included for the qualitative analysis based on items from the standards for reporting qualitative research (SRQR) (O'Brien *et al.*, 2014).

3.2 Data collection instrument

The online survey consisted of 25 questions based on the Theoretical Domains Framework (TDF) of behaviour change (Atkins *et al.*, 2017), and four demographic questions.
The TDF is a validated, theory-informed methodological framework developed by behavioural scientists consisting of 14 domains (Atkins *et al.*, 2017) (table 1). Findings based on this theory-driven framework are used to inform explicit targets for relevant and effective interventions as part of a stepped approach to changing clinical behaviour (French *et al.*, 2012). In this study it has been used to understand the facilitators and barriers to including

skin tone diversity when teaching skin assessment to inform future interventions. The survey questions were based on target behaviours from the TDF framework (Atkins *et al.*, 2017) agreed by the research team (table 1). All quantitative questions in this part of the survey required a response.

The four questions related to participant characteristics asked about roles, professional registration, skin tone and ethnicity. To determine skin tone, the 19 colour blocks of the skin tones present in the Skin Tones Tool (Ho and Robinson, 2015) were presented randomly and participants were asked to self-select the one which closely matches the skin on the inside part of the upper arm.

INSERT - TABLE 1: THEORETICAL DOMAINS FRAMEWORK OF BEHAVIOUR CHANGE, IDENTIFYING RELEVANT TARGET BEHAVIOURS AND QUESTIONS RELATING TO THEM

Table 1: Theoretical Domains Framework of behaviour change, identifying relevant target behaviours and questions relating to them

Domain	Definition from Theoretical Domains Framework of behavioural change	Included	Question(s) (Type of response)
Knowledge	An awareness of the existence of something	Yes	Q15) What guidelines or specific considerations are you aware of about assessing the skin and tissue of people with dark skin tones? (Free text)
Skills	An ability or proficiency acquired through practice	No	
Social / professional role and identity	A coherent set of behaviours and displayed personal qualities of an individual in a social or work setting	Yes	Q2) Whose responsibility is it to teach student nurses about skin and tissue integrity? (*Nominal Data from* Select all that apply)
			Q3) Do you feel the individual responsible for this teaching should change when specifically considering people who have dark skin tones? (*Nominal Data from* Yes / No)
			Q4) Why / Why not (Free text)
Beliefs about capabilities	Acceptance of the truth, reality or validity about an ability, talent or facility that a person can put to constructive use	Yes	Q5) What best describes how you think or feel regarding your current ability to assess for pressure damage on a patient with light (white) skin tones? (Ordinal data from Single Choice MCQ, Responses based on: Grundy, 1993, Confidence in physical assessment in nursing scale) Note: The same question was asked for the following skin conditions: - Chronic venous insufficiency (Q7) - Incontinence associated dermatitis (Q13) - Infection and inflammation (Q11) - Peripheral arterial disease (Q8)

			Q6) What best describes how you think or feel regarding your current ability to assess for pressure damage on a patient with dark (black or brown) skin tones? (Ordinal data from Single Choice MCQ, Responses based on: Grundy, 1993, Confidence in physical assessment in nursing scale) Note: The same question was asked for the following skin conditions: - Chronic venous insufficiency (Q9) - Incontinence associated dermatitis (Q14) - Infection and inflammation (Q12) - Peripheral arterial disease (Q10)
Optimism	The confidence that things will happen for the best or that desired goals will be attained	Yes	Q26) How confident are you that the students and junior nurses you are involved in teaching will be taught about the assessment of skin and tissues across a diverse range of skin tones by other members of staff (either within university or in clinical practice) *(Ordinal data from 7-point Likert Scale: Completely confident to Completely unconfident)*
Beliefs about Consequences	Acceptance of the truth, reality, or validity about outcomes of a behaviour in a given situation	Yes	Q23) What are the consequences of not teaching skin and tissue assessment for people with dark skin tones? *(Free text)*
Reinforcement	Increasing the probability of a response by arranging a dependent relationship, or contingency, between the response and a given stimulus	Yes	Q22) I feel supported from my colleagues to teach about skin and tissue assessment for people with a range for skin tones (including dark skin tones). *(Ordinal data from 7-point Likert Scale: Strongly Agree to Strongly Disagree)*
			Q25) What are the positive effects of teaching skin tone diversity to your students or junior staff? (either from student, patient or management perspective). *(Free text)*

Intentions	A conscious decision to perform a behaviour or a resolve to act in a certain way	Yes	Q24) Wound you consider including skin tone diversity in skin and tissue assessment within your teaching (*Ordinal data from* Single Choice MCQ, Responses based on: Prochaska,& DiClemente *1983*, Stages of Change model)
Goals	Mental representations of outcomes or end states that an individual wants to achieve	No	
Memory, attention and decision processes	The ability to retain information, focus selectively on aspects of the environment and choose between two or more alternatives	No	
Environmental context and resources	Any circumstance of a person's situation or environment that discourages or encourages the development of skills and abilities, independence, social competence and adaptive behaviour	Yes	Q17) What tools and resources do you have available to you that support you teaching skin and tissue assessment? *(Nominal Data from Select all that apply)*
			Q18) How frequently do the resources you use to teach skin and tissue assessment outside of direct patient care (e.g.: lectures, case-discussions, simulations etc.) depict dark (brown or black) skin tones? *(Ordinal data from 5-point Likert Scale: Always to Never, with not applicable option)*
			Q19) Why? *(Free text)*
			Q20) How frequently do you select a patient with brown or black skin tones to teach skin and tissue assessment within the direct patient care environment? *(Ordinal data from 5-point Likert Scale: Always to Never, with not applicable option)*
			Q21) Why? *(Free text)*
Social influences	Those interpersonal processes that can cause	Yes	Q16) What factors have influenced skin tone diversity being taught

	individuals to change their thoughts, feelings, or behaviours		in the assessment of skin and tissues within your practice *(Nominal Data from Select all that apply)*
Emotion	A complex reaction pattern, involving experiential, behavioural, and physiological elements, by which the individual attempts to deal with a personally significant matter or event	No	
Behavioural regulation	Anything aimed at managing or changing objectively observed or measured actions	No	

3.2 Participants and recruitment

Participants were recruited on social media via Twitter and Facebook. The invitations to participate were shared by several professional organisations that represent specific clinical fields in nursing (Queens Nursing Institute, Society of Tissue Viability, RCN District & Community nurse forum, RCN Older people's forum) and nurse education (Association of Advanced Practice Educators, Association of District Nurse Educators, RCN Education forum). Email addresses were also sought of all nursing leads or heads of department of the 94 nursing courses advertised on UCAS via their university website. Emails were successfully sent to senior staff members in 86 nursing departments informing them of the study and asking for their support in circulating the study invitation, this was followed up with a further email two weeks later if there was no response. All staff teaching on adult or general nursing programmes at 21 universities (22.3%) were then contacted inviting them to participate either via email addresses listed on the university website or through an administrator at the university.

Data were collected online using Microsoft forms within Microsoft 365 throughout February and March 2023.

3.3 Ethical considerations

Participants confirmed they had read and understood the information provided and agreed for the data collected within this survey to be used for the research. All data were collected anonymously. Data were processed and stored securely using password protection and used

under the terms of UK data protection law and UK General Data Protection Regulation.

Ethical Clearance Reference Number: MRA-22/23-35171.

3.1. Qualitative data analysis

This study used a hybrid inductive/deductive data analysis approach based on recommendations for analysing data using the TDF framework (Atkins *et al.*, 2017). This theory driven analysis ensures findings remain grounded in theory to inform behavioural change interventions (Atkins *et al.*, 2017).

Qualitative data were pseudonymized and any identifiable data or links to participant characteristics removed. Authors XX & XX familiarized themselves with the data and generated initial codes of interesting features within the data for initial coding. XX coded the data based on these agreed codes in NVivo (version 12). These codes were then grouped to form themes and aligned under the over-arching domain with the 14 items on the Theoretical Domains Framework (Atkins *et al.*, 2017)**.** All authors reviewed the draft coding and mapping of themes to the theoretical domain's framework and suggested modifications. Themes were refined following feedback and names of the themes agreed upon among all authors.

3.2. Quantitative data analysis

Frequencies of nominal data were calculated and descriptive statistics presented. Where ordinal responses were provided, these were given a numeric value so non-parametric statistical tests could be performed. Questions relating to confidence in undertaking skin assessment between dark and light skin tones were analysed using Wilcoxon test (*W*) to

compare two paired groups. Where ordinal data were compared to participant characteristics the Mann-Whitney test (*U*) was used to compare two unpaired groups (e.g. specialist clinicians to non-specialists).

Frequencies of nominal data were automatically presented in Microsoft Forms. Prior to statistical analysis, data were exported to Microsoft Excel where they were organised and ordinal descriptions given numeric codes. Data were transferred to Mini-Tab (version 19) for analysis.

Data have been collated and presented based on the domains of the Theoretical Domains Framework of behaviour change.

4. Results

4.1. Participant characteristics

73 participants completed the survey. All were registered nurses. 26 (35.6%) predominately taught in practice and 47 (64.4%) predominately taught in higher education institutes. Most participants had skin tones from the top row of the Ho & Robinson (2015) Skin Tones Tool (n=55, 75.3%), and a fifth (n=16, 21.9%) were specialist wound or tissue viability healthcare professionals (table 2).

INSERT - TABLE 2: PARTICIPANT DEMOGRAPHICS

Table 2: Participant demographics

	n	%
Main role where nurses are taught		
Specialist wound or tissue viability health care professional		
In practice	9	12.3
In a HEI (university)	7	9.6
Non-specialist with an interest in wound care and tissue viability		
In practice	4	5.5
In a HEI (university)	11	15.1
Other registered nurse or health care professional		
In practice	13	17.8
In a HEI (university)	29	39.7
Self-selected skin tone (grouped into categories)		
Row 1 $^{\delta}$	55	75.3
Row 2 $^{\delta}$	11	15.1
Row 3 $^{\delta}$	1	1.4
Row 5 $^{\delta}$	3	4.1
Prefer not to say	3	4.1
Already include teaching that includes skin tone diversity	47	64.4
Felt it was their responsibility to include skin assessment in their teaching	54	74

δ = on Ho and Robinson (2015) Skin Tones Tool.

4.2. Barriers and enablers identified within relevant domains.

The main barriers and enablers for including skin tone diversity within skin assessment were related to twelve domains in the Theoretical Domains Framework (TDF). The coding tree (figure 1) divides themes into barriers, facilitators and neutral findings and relates these to aspects of the TDF. The findings and these subthemes are discussed under each of the relevant domains from the TDF.

4.2.1. Knowledge

Most respondents had some knowledge of guidance on the influence of skin tone in skin assessment. The most frequent guidelines cited were Wounds UK Best Practice Statement

on addressing skin tone bias in wound care (n=21, 28.7%), EPUAP/NPUAP pressure ulcer definitions (n=6, 8.2%) and Mind the Gap: a handbook of clinical signs in black and brown skin (n=6, 8.2%). Several participants accurately stated specific considerations when assessing the skin of people with dark skin tones even when specific guidelines were not mentioned. This included looking for pigmentation changes (n=7, 9.6%) and feeling the skin to look for temperature changes, oedema or induration (n= 7, 9.6%).

There was an assumption that specialist knowledge of skin assessment in people with dark skin tones would be delivered elsewhere, suggesting non-wound care specialists may omit including skin tone diversity in their teaching even though they may have some underpinning knowledge of its importance. This statement epitomises this belief,

"*The knowledge, experience and skills involved to deliver the fundamentals of skin integrity and maintenance shouldn't change, more in depth knowledge etc should come from those with that level of knowledge" (Participant 41)*

Seven respondents were unaware of any specific guidance or specific considerations when assessing people with dark skin tones, three gave answers we couldn't decipher and four gave inaccurate information (14/73 in total = 19.2%). Qualitative comments support this,

"*We should have the knowledge and skills, because we often care for patients with different skin tones. However, I feel my knowledge is less for different [skin] tone" (Participant 12).*

Further indicating knowledge gaps that may exist on this topic.

4.2.2. Skills

Qualitative comments revealed two neutral themes related to the skills of individuals teaching skin assessment. Participants stated there were variations and complexities in the presentation of skin changes across a range of skin tones. Although this was presented as a neutral comment by some, often this was reported as “more challenging” or “harder to detect” on people with dark skin tones.

There was some recognition that a pre-requisite to developing skills of clinical assessment across skin tones required practice exposure.

“I think the person teaching should have relevant knowledge and experience of assessing people with dark skin tones. I think all practitioners involved in assessing skin should have experience of assessing a wide variety of skin tones”

(Participant 47)

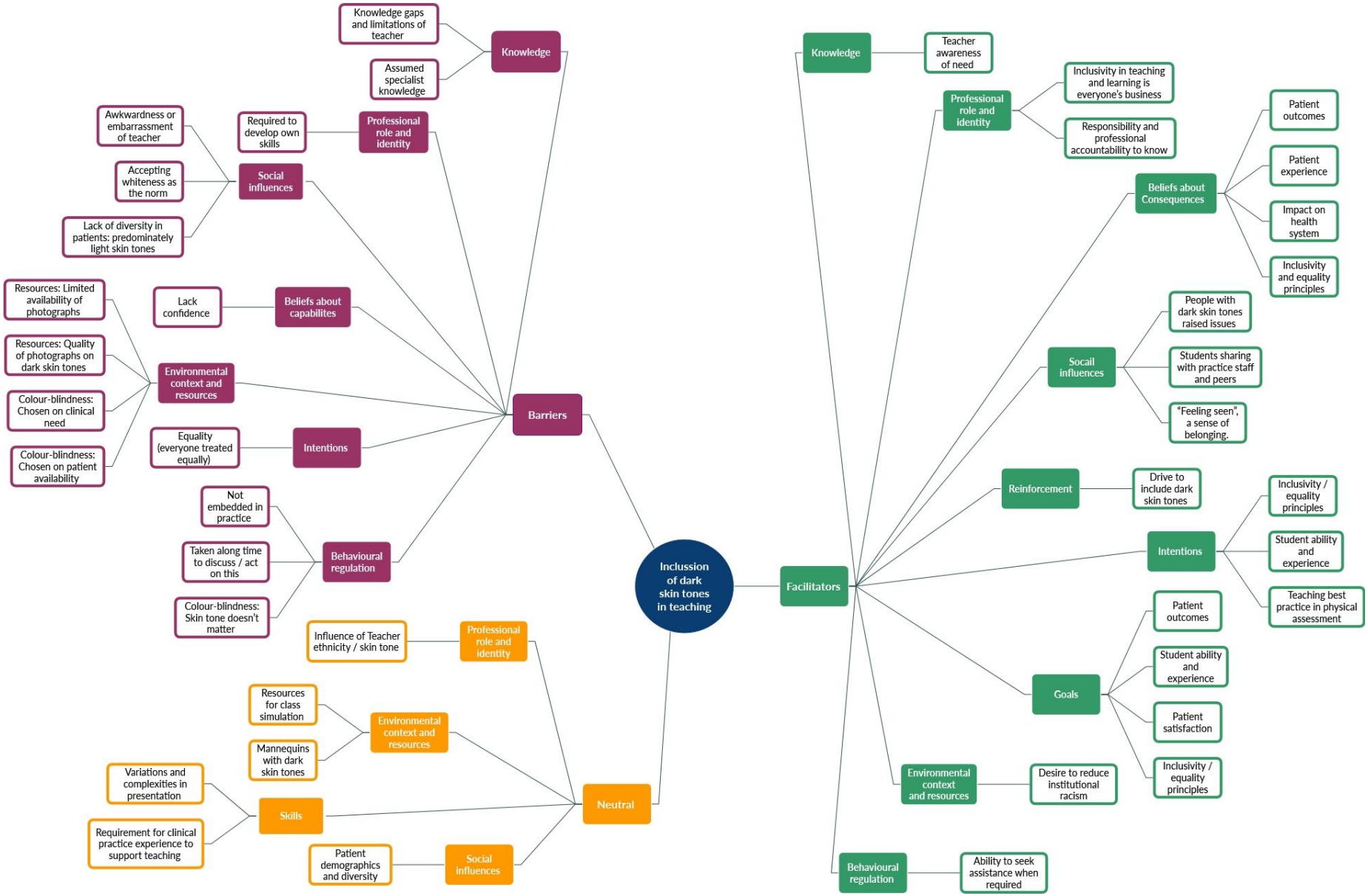
The lack of exposure presented a barrier for some respondents, such as those working in areas with predominantly people with light skin tones or no longer working in direct patient care settings.

4.2.3. Goals, intentions and consequences

Two thirds of participants already included skin tone diversity in their teaching (n=47, 64.4%). Of those who did not, nine participants (12.3%) reported they were developing resources to include this and 15 (20.5%) were considering the practicalities of teaching this.

Only two were not thinking of covering this in their teaching but they felt it was covered elsewhere in the programme. These domains identified key facilitators of the inclusion of skin tone diversity in teaching (figure 1). Across all these three domains qualitative comments included those relating to inclusivity and equity principles. However, other key areas were mentioned such as the consequences of not teaching skin tone diversity relating to poor patient outcomes and experiences, to improve students' ability and experiences, and teach best practice in physical assessment of the skin (figure 1). One potential barrier existed in teacher intentions relating to the desire to treat everyone equally (equality)

INSERT - FIGURE 1: CODING TREE OF BARRIERS AND FACILITATORS TO INCLUDE SKIN TONE DIVERSITY IN TEACHING BY DOMAINS AND MAIN THEMES OF QUALITATIVE COMMENTS


Inclussion of dark skin tones in teaching
Barriers
Knowledge
Knowledge gaps and limitations of teacher
Assumed specialist knowledge
Professional role and identity
Required to develop own skills
Social influences
Awkwardness or embarrassment of teacher
Accepting whiteness as the norm
Lack of diversity in patients: predominately light skin tones
Beliefs about capabilites
Lack confidence
Environmental context and resources
Resources: Limited availability of photographs
Resources: Quality of photographs on dark skin tones
Colour-blindness: Chosen on clinical need
Colour-blindness: Chosen on patient availability
Intentions
Equality (everyone treated equally)
Behavioural regulation
Not embedded in practice
Taken along time to discuss / act on this
Colour-blindness: Skin tone doesn't matter
Neutral
Professional role and identity
Influence of Teacher ethnicity / skin tone
Environmental context and resources
Resources for class simulation
Mannequins with dark skin tones
Skills
Variations and complexities in presentation
Requirement for clinical practice experience to support teaching
Social influences
Patient demographics and diversity
Facilitators
Knowledge
Teacher awareness of need
Professional role and identity
Inclusivity in teaching and learning is everyone's business
Responsibility and professional accountability to know
Beliefs about Consequences
Patient outcomes
Patient experience
Impact on health system
Inclusivity and equality principles
Socail influences
People with dark skin tones raised issues
Students sharing with practice staff and peers
"Feeling seen", a sense of belonging.
Reinforcement
Drive to include dark skin tones
Intentions
Inclusivity / equality principles
Student ability and experience
Teaching best practice in physical assessment
Goals
Patient outcomes
Student ability and experience
Patient satisfaction
Inclusivity / equality principles
Environmental context and resources
Desire to reduce institutional racism
Behavioural regulation
Ability to seek assistance when required

4.2.4. Professional identity

Participants felt the responsibility to teach students about skin integrity lay with either any nurse in practice (n=63, 86.3%), tissue viability specialist nurses in practice (n=62, 84.9%) or tissue viability specialist nurses in universities (n=62, 84.9%). Fewer respondents felt it was the responsibility of those with a specific educational role such as any educator at university (n=57, 78.1%), practice educators (n=57, 78.1%) or practice supervisors (n=51, 70.0%). Irrespective of the barriers they faced elsewhere there was a clear professional accountability demonstrated by participants to include skin tone diversity in their teaching. There was a perception that inclusivity in teaching and learning is important for all, and educators have the responsibility and accountability to know about this (figure 1). Several participants recognised the requirement to develop their own knowledge and skills on this topic through their own professional development to teach this and often demonstrated professional responsibility and commitment to this. This quotation exemplified this,

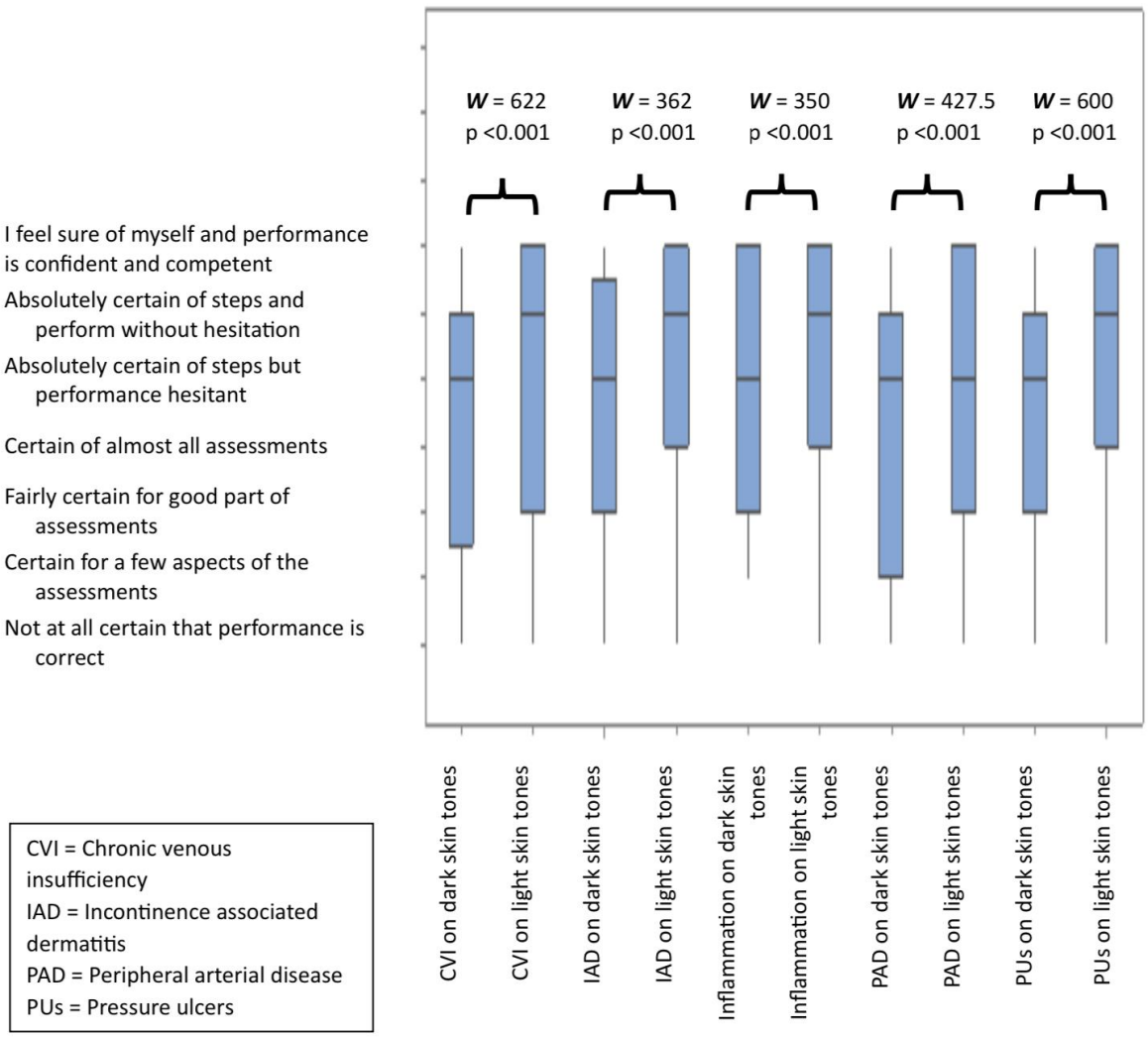
> *"It's down to me a clinician to research darker skin and the elements within this topic to be able to bring out different aspects…. As a white person, I made it my aim to try and gather as much info about different colour skin tones to be able to treat ALL people" (Participant 44)*

Highlighting the professionalism of respondents in addressing their own knowledge gaps on this topic.

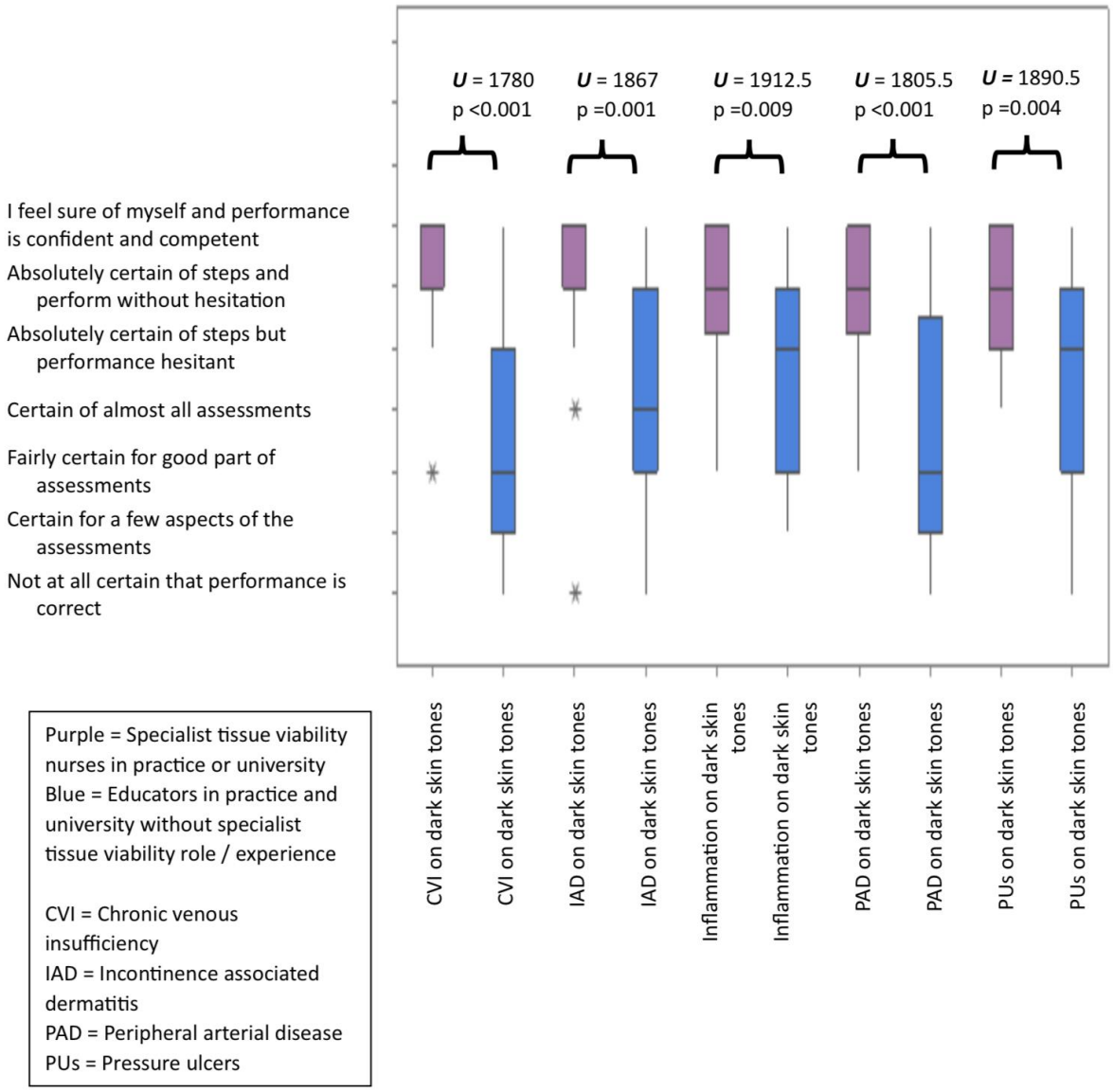
4.2.5. Beliefs about capabilities

Participants were significantly less confident in assessing dark skin tones than light skin tones across all aetiologies (figure 2). This was especially noticeable in non-specialist tissue viability healthcare educators for chronic venous insufficiency and peripheral arterial disease where 50.9% were only certain up to a few aspects of the assessment when assessing people with dark skin tones. However, it was noticeable across all aetiologies and experience, with statistically significant differences in confidence found throughout. However, some of the participants' characteristics also impacted confidence. Confidence among specialist tissue viability nurses (from practice or working in a HEIs) was significantly greater in assessing people with dark skin tones across all aetiologies than their non-specialist counterparts (figure 3). There was also a trend for individuals with dark skin tones to be more confident at assessing skin changes in dark skin tones than light skin tones. However, the sample size of participants with dark skin tones was too small to undertake statistical analysis.

INSERT - FIGURE 2: BOX PLOT OF CONFIDENCE IN UNDERTAKING SKIN AND TISSUE ASSESSMENTS



INSERT - FIGURE 3: COMPARISON IN CONFIDENCE BETWEEN SPECIALIST TISSUE VIABILITY NURSES AND NON-SPECIALIST ASSESSING PEOPLE WITH DARK SKIN TONES



4.2.6. Optimism

29 participants (39.7%) were confident that student and junior nurses are taught skin assessment across a diverse range of skin tones by other members of staff. Three (4.1%) were completely unconfident, seven (9.6%) were fairly unconfident and 16 (21.9%) were somewhat unconfident.

4.2.7. Reinforcement

Two thirds of participants (n=51, 69.8%) felt supported by their colleagues to teach skin assessment across a range of skin tones. Qualitative comments from participants indicate there has been a recent drive to include skin tone diversity which facilitates educators to include this both in and outside of direct patient care settings (figure 1).

4.2.8. Environmental context and resources

Most participants (n= 67, 91.8%) used photographs to support their teaching of skin and tissue assessment. However, the lack of available photographs was a barrier to including people with dark skin tones within teaching, with educators reporting adapting case studies to the resources they have available.

"Photos of darker skin tones and the damage is more difficult to obtain, without copyright. My photos are mostly white skin as the photos turn out better. The low level skin changes are difficult for amateur photographers to pick up on darker skin tones. High level damage is easy across all skin tones."

(Participant 58).

In the direct patient care environment, patients were selected for teaching opportunities based on clinical need or patient availability and not considering their skin tone.

4.2.9. Social influences

Many educators taught about skin tone diversity when teaching skin assessment based on their own clinical experience (n = 48, 65.7%), their own education (n= 37, 50.7%) and the

demographics of patients in their locality (n=36, 49.3%). There appeared to be a clear recognition of the need to teach skin tone diversity in skin assessment when working in multicultural areas but it was also raised as a reason for a lack of inclusivity in areas with predominantly light skin toned populations, both when teaching skin assessment in practice and outside of direct patient care.

There also remained some awkwardness or embarrassment from the teacher when teaching about the assessment of people with dark skin tones and an acceptance that whiteness is the norm, with some teaching staff or students not questioning the presentation of skin changes on dark skin.

"They [student] tend not to think about it. They rarely challenge written or spoken statements about 'skin looking blue', even if they themselves are not white!" (Participant 65)

Although students with dark skin tones may not question skin assessment being taught through a white lens there were comments from some participants about the importance of learners with dark skin tones feeling seen and represented in the teaching resources to have a sense of belonging. Reliance on teachers or clinicians with dark skin tones to highlight where practice is not inclusive was also reported.

"My university had two Black lecturers who raised the issue and the dept[ment] responded by buying Black & Brown mannequins and patches" (Participant 6)

Listening to the experiences and perceptions of inclusion from colleagues with dark skin tones was considered by participants to be advantageous to improve education provision.

4.2.10. Behavioural regulation

Self-regulation of behaviour for some related to their perception that skin tone does not matter when teaching skin assessment. This may be associated with the inclusion of skin tone in teaching not being embedded into practice. However, some educators did not acknowledge skin presentation varied across skin tones, illustrated by this statement.

"I do not care about race, religion, looks, skin tones. I'm concerned about the PATIENT as a human being" (Participant 44)

Several people reported they had the ability to seek help to modify their behaviour on teaching skin assessment across all skin tones. However, frequently this meant consulting with clinicians with more experience and reliance on staff members with dark skin tones to support this topic.

5. Discussion

Our findings indicate that most participants were aware of the importance to represent people with both dark and light skin tones when teaching skin assessment, and they demonstrated professional accountability, interest and commitment to ensuring their students and colleagues know how to undertake skin assessment across a range of skin

tones. However, findings also identified several areas that are barriers or challenges to including skin tone diversity in teaching skin assessment.

Many educators lacked confidence in these skills themselves. This may be associated with international guidelines omitting signs and symptoms specific to dark skin tones for infection (Swanson *et al.*, 2022), chronic venous insufficiency (De Maeseneer *et al.*, 2022; Lurie *et al.*, 2020) and peripheral arterial disease (Aboyans *et al.*, 2018) causing a reliance on acquiring these skills in person through experiential learning during practice exposure. Although not considered specifically for skin assessment, experiential learning is often relied on in wound care to develop nursing knowledge and skills (Welsh, 2018; Gray *et al.*, 2019). This causes gaps in knowledge and a lack of application of evidence-based practice (Welsh, 2018). Therefore, improved evidence based clinical guidance to support skin assessment across all skin tones is needed. However, our results suggest that tissue viability nurse specialists may have experience that enables them to be more confident in assessing dark skin tones than non-specialist clinicians and therefore may be a good source of information to support practice.

Having highlighted the importance of updating clinical guidance, even when guidelines on assessment exist that identify the signs and symptoms in dark skin tones, such as in the pressure ulcer guidelines by European Pressure Ulcer Advisory Panel, National Pressure Injury Advisory Panel and Pan Pacific Pressure Injury Alliance (2019), our findings demonstrated the confidence of teachers varied between their assessments on people with dark and light skin tones. Previous studies also indicated that the inclusion of dark skin tones in a clinical guideline did not result in skin tone diversity being taught in skin assessment (Oozageer Gunowa *et al.*, 2021). Indicating the availability of clinical guidance alone is insufficient for ensuring the inclusion of skin tone diversity in teaching.

The scarcity of appropriate wound and skin images was a clear barrier to the inclusion of dark skin tones for teaching outside of direct patient care. This is an international problem that requires addressing with a dearth of images depicting skin changes for people with dark skin tones in textbooks (Louie and Wilkes, 2018; Pusey-Reid et al., 2023) within a top-ranking international peer reviewed journals (Diao and Adamson, 2022; Wilson et al., 2021) This bias has led to a white predominance in nursing and healthcare resources, ignorant of the impact skin tone diversity has on the presentation of skin changes. However, it is acknowledged some resources are becoming available that depict skin changes in people with dark skin tones such as the freely available "mind the gap: a handbook of clinical signs in black and brown skin" (Mukwende et al., 2020).

In some situations, there was a reliance on people with dark skin tones to highlight where skin tone diversity was not included in teaching and to be used as a resource to support colleagues with light skin tones. Seeking advice from colleagues may be a valuable resource as our findings indicate respondents found it easier to assess skin tones similar to their own. However, in a survey with a greater number of staff with dark skin tones, staff reported a decrease in confidence assessing pressure damage on people with dark skin tones, regardless of their own ethnicity (Kariwo, Chapman & Oozageer Gunowa, 2023). Additionally relying on colleagues with dark skin tones to highlight issues may be limited due to the barriers in carrier progression for nurses from ethnic minorities (Ross *et al.*, 2020) or some feeling unable to speak up about changing existing practice due to previous experiences of working in the NHS making them feel bullied or ignored (Ross *et al.*, 2020)**.** Additionally, people with dark skin tones may feel fatigued from the emotional disconnect and defensiveness they may have experienced in the past when talking about structural racism (Eddo-Lodge, 2021). Therefore, it is essential there is a collaborative approach from all staff,

regardless of skin tone, to identify and highlight where the inclusion of skin tone diversity in skin assessment teaching is lacking to benefit patient outcomes.

Frequently participants completing the survey wanted to ensure all patients regardless of skin tone were treated equally, selecting patients on clinical need and interesting cases rather than teaching common conditions on a range of skin tones. This colour blindness in case-selection is a barrier to ensuring skin tone diversity is taught especially in areas with predominantly light skin tones where exposure to dark skin tones may be limited. Not acknowledging skin colour as an important component to clinical presentation can lead to the learner not appreciating the variation in clinical presentation (Wounds UK, 2021), not acknowledging these differences (Oozageer Gunowa *et al.*, 2021) and a reinforcement of white normativity in nurse education (Oozageer Gunowa *et al.*, 2021). However, if teaching intentions support best practice criteria in skin assessment across all skin tones, encompassing feeling for warmth, turgor, and patient reported changes in sensation, symptoms (pain or itch) or appearance (Dhoonmoon *et al.*, 2023), all patients would benefit from a more detailed and accurate assessment to aid clinical diagnosis.

5.1. Researcher characteristics and reflexivity.

All researchers are registered nurses currently working in a higher education institute, with a range of clinical experiences (secondary, tertiary and community care) from areas with diverse multi-cultural populations seeing patients with a variety of skin tones. One author (XX) also currently works in a patient facing role.

5.2. Generalisability and limitations

The self-selecting nature of this sample may not be representative of all those who teach skin assessment to students and registered nurses, as many participants would have seen the advert to participate through the professional networks on social media they were engaged in.

6. Conclusions

Findings indicate there is some awareness of the importance of including diverse skin tone tones in teaching but even within this self-selecting sample of engaged nurse educators further resources are needed to overcome a historic unconscious bias that has led to a lack of teacher confidence, photographic resources and evidence based guidelines of clinical presentations in dark skin tones. There is also a need to teach best practice criteria in skin assessment for all patients and include examples from patients with diverse skin tones when teaching skin changes of common conditions, especially in areas with predominately light skin tones, to ensure variation in clinical presentation is recognised.

References

Aboyans V, Ricco J, Bartelink MEL, Björck M, Brodmann M, Cohnert T, Collet J, Czerny M, De Carlo M, Debus S, Espinola-Klein C, Kahan T, Kownator S, Mazzolai L, Naylor AR, Roffi M, Röther J, Sprynger M, Tendera M, Tepe G, Venermo M, Vlachopoulos C, Desormais I (2018) 2017 ESC Guidelines on the Diagnosis and Treatment of Peripheral Arterial Diseases, in collaboration with the European Society for Vascular Surgery (ESVS). *European Heart Journal*, 39(9), 763-816.

Atkins L, Francis J, Islam R, O'Connor D, Patey A, Ivers N, Foy R, Duncan EM, Colquhoun H, Grimshaw JM, Lawton R, Michie S (2017) A guide to using the Theoretical Domains Framework of behaviour change to investigate implementation problems. *Implementation science: IS*, 12(1), 77.

Bates-Jensen BM, Anber K, Chen MM, Collins S, Esparza AN, Gieschen K, Haglund E, Lim JY, Lin C, Taw E, Rodriguez S, Truong M, Tubillo P, Xiao A, McCreath HE (2021) Natural History of Pressure Injury Among Ethnically/Racially Diverse Nursing Home Residents: The Pressure Ulcer Detection Study. *Journal of Gerontological Nursing*, 47(3), 37-46

Eddo-Lodge R (2021) Why I am no longer talking to white people about race. Available at: renieddologe.co.uk [accessed 30/11/2023].

DeMaeseneer MG, Kakkos SK, Aherne T, Baekgaard N, Black S, Blomgren L, Giannoukas A, Gohel M, de Graaf R, Hamel-Desnos C, Jawien A, Jaworucka-Kaczorowska A, Lattimer CR, Mosti G, Noppeney T, van Rijn MJ, Stansby G, Esvs Guidelines Committee n, Kolh P, Bastos Goncalves F, Chakfé N, Coscas R, de Borst GJ, Dias NV, Hinchliffe RJ, Koncar IB, Lindholt JS, Trimarchi S, Tulamo R, Twine CP, Vermassen F, Wanhainen A, Document Reviewers n, Björck M, Labropoulos N, Lurie F, Mansilha A, Nyamekye IK, Ramirez Ortega M, Ulloa JH, Urbanek T, van Rij AM, Vuylsteke ME (2022) Editor's Choice - European Society for Vascular Surgery (ESVS) 2022 Clinical Practice Guidelines on the Management of Chronic Venous Disease of the Lower Limbs. *European Journal of Vascular and Endovascular Surgery: The Official Journal of the European Society for Vascular Surgery*, 63(2), 184-267.

Dhoonmoon L, Nair HKR, Abbas Z, Andrews E, McConnie S, Pearson J, Waheed M, Wijeyaratne M (2023) International Consensus Document: Wound care and skin tone signs, symptoms and terminology for all skin tones. Available at: www.woundsinternational.com [Accessed on 25/05/2023].

Diao JA, Adamson AS (2022) Representation and misdiagnosis of dark skin in a large-scale visual diagnostic challenge. *Journal of the American Academy of Dermatology*, 86(4), 950-1.

European Pressure Ulcer Advisory Panel, National Pressure Injury Advisory Panel, Pan Pacific Pressure Injury Alliance (2019) Pressure ulcer treatment and prevention 2019 quick

reference guide. Available at: https://www.epuap.org/pu-guidelines/ [Accessed on 15/01/2023].

French SD, Green SE, O'Connor DA, McKenzie JE, Francis JJ, Michie S, Buchbinder R, Schattner P, Spike N, Grimshaw JM (2012) Developing theory-informed behaviour change interventions to implement evidence into practice: a systematic approach using the Theoretical Domains Framework. *Implementation science: IS*, 7, 38.

Gray TA, Wilson P, Dumville JC, Cullum NA (2019) What factors influence community wound care in the UK? A focus group study using the Theoretical Domains Framework. *BMJ open*, 9(7), e024859.

Grundy S (1993) The Confidence Scale: Development and Psychometric Characteristics. *Nurse Educator*, 18(1), 6-9.

Ho B.K., Robinson J.K (2015) Color bar tool for skin type self-identification: a cross sectional study. *Journal of the American Academy of Dermatology*. 73 (2), 312-313.e1.

Holloway S, Pokorná A, Janssen AHJ, Ousey K, Probst S (2020) Wound curriculum for nurses: Post-registration qualification wound management – European Qualification Framework level 7. *Journal of Wound Care*, 29(7 (Suppl. 7)), S1-S39.

Kariwo K, Chapman M, Oozageer Gunowa N (2023) How does skin tones affect staff confidence when dealing with pressure ulcers. *Wounds International*, 14(2), 21-7.

Louie P, Wilkes R (2018) Representations of race and skin tone in medical textbook imagery. *Social Science & Medicine (1982)*, 202, 38-42.

Lurie F, Passman M, Meisner M, Dalsing M, Masuda E, Welch H, Bush RL, Blebea J, Carpentier PH, De Maeseneer M, Gasparis A, Labropoulos N, Marston WA, Rafetto J, Santiago F, Shortell C, Uhl JF, Urbanek T, van Rij A, Eklof B, Gloviczki P, Kistner R, Lawrence P, Moneta G, Padberg F, Perrin M, Wakefield T (2020) The 2020 update of the CEAP classification system and reporting standards. *Journal of Vascular Surgery. Venous and lymphatic disorders*, 8(3), 342-52.

Mukwende M., Tamony P., Tuner M (2020) Mind the gap: A handbook of clinical skins in black and brown skin. Available at: https://www.blackandbrownskin.co.uk/mindthegap [Accessed on 30/11/2023]

Nursing and Midwifery Council (2018) Standards of proficiency for registered nurses. Available at: https://www.nmc.org.uk/globalassets/sitedocuments/standards-of-proficiency/nurses/future-nurse-proficiencies.pdf [Accessed on 13/10/2022].

O'Brien B, Harris I, Beckman T, Reed D, Cook D (2014) Standards for Reporting Qualitative Research: A Synthesis of Recommendations. *Academic Medicine*, 89(9), 1245-51.

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), 3266-75.

Oozageer Gunowa N, Hutchinson M, Brooke J, Aveyard H, Jackson D (2021) Pressure injuries and skin tone diversity in undergraduate nurse education: Qualitative perspectives from a mixed methods study. *Journal of Advanced Nursing*, 77(11), 4511-24.

Pusey-Reid E, Quinn L.W, Wong J, Wucherpfennig A (2023) Representation of dark skin tones in foundational nursing textbooks: an image analysis. Nurse education today, 130 (1): 105927. https://doi.org/10.1016/j.nedt.2023.105927

Ross S, Jabbal J, Chauhan K, Maguire D, Randhawa M, Dahir S (2020) Workforce race inequalities and inclusion in NHS providers. Available at: https://www.kingsfund.org.uk/ [Accessed on 25/05/2023].

Sharma A, Minh Duc NT, Luu Lam Thang T, Nam NH, Ng SJ, Abbas KS, Huy NT, Marušić A, Paul CL, Kwok J, Karbwang J, de Waure C, mmond FJ, Kizawa Y, Taal E, Vermeulen J, Lee GHM, Gyedu A, To KG, Verra ML, Jacqz-Aigrain ÉM, Leclercq WKG, Salminen ST, Sherbourne CD, Mintzes B, Lozano S, Tran US, Matsui M, Karamouzian M (2021) A Consensus-Based Checklist for Reporting of Survey Studies (CROSS). *Journal of General Internal Medicine : JGIM*, 36(10), 3179-87.

Swanson T, Ousey K, Haesler E, Bjarnsholt T, Carville K, Idensohn P, Kalan L, Keast DH, Larsen D, Percival S, Schultz G, Sussman G, Waters N, Weir D (2022) IWII Wound Infection in Clinical Practice consensus document: 2022 update. *Journal of Wound Care*, 31(Sup12), S10-21.

Welsh L (2018) Wound care evidence, knowledge and education amongst nurses: a semi-systematic literature review. *International Wound Journal*, 15(1), 53-61.

Wilson BN, Sun M, Ashbaugh AG, Ohri S, Yeh C, Murrell DF, Murase JE. Assessment of skin of color and diversity and inclusion content of dermatologic published literature: An analysis and call to action. *International Journal of Women's Dermatology*. 20;7(4):391-397.

Wounds UK (2021) Best Practice Statement: Addressing skin tone bias in wound care: assessing signs and symptoms in people with dark skin tones. Available at: https://wounds-uk.com/ [Accessed on 25/05/2023].