

“Knowing is not doing”: knowledge, misconceptions and perceived barriers to pressure ulcer prevention practice among nursing students at a tertiary institution in the United Arab Emirates

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Abstract

Background

Pressure ulcers are largely preventable, yet their burden across acute care in the UAE and the Gulf region is substantial and growing. Nursing students are the future workforce expected to prevent them, but it is unknown whether pre-registration education equips them to do so locally. This study assessed students' knowledge of pressure ulcer prevention and the barriers they perceive in translating it into practice.

Methods

A cross-sectional study with an embedded qualitative component was conducted among 133 nursing students at a UAE health sciences college, using an adapted 31-item Pressure Injury Prevention Knowledge (PIPK) questionnaire and two open-ended questions on barriers and suggested improvements. Descriptive statistics, t-tests, ANOVA, chi-square tests and Spearman correlations were computed; reflexive thematic analysis was used to analyse while strategies for improvement responses were analysed through content analysis.

Results

Participants (mean age 21.9 ± 1.9 years; 99.2% Emirati) scored 19.9 ± 5.2 of 31 ($64.1\% \pm 16.6\%$); 20.3% showed good knowledge ($\geq 80\%$), 42.1% moderate and 37.6% poor ($< 60\%$). The five lowest-scoring items were all outdated practices students needed to reject: hyper-oxygenated fatty acids for moisture protection (14.3% correct), head-of-bed elevation of $30-45^\circ$ (17.3%), heel bandaging (19.5%), a 48-hour admission skin assessment window (24.8%) and doughnut-shaped devices (36.8%). Knowledge correlated with year of study ($p = 0.245$, $p = 0.006$) and clinical placements ($p = 0.220$, $p = 0.014$). Thematic analysis of 112 barrier responses generated six themes, the largest (54%) a two-sided knowledge–practice gap; time scarcity (51%), workforce-capacity constraints (43%), equipment shortfalls (26%), communication breakdowns (13%) and patient complexity (12%) followed. Suggested improvements centred on regular training (58.9%), simulation (35.7%), and updated guidelines (22.3%).

Conclusions

Students knew affirmative recommendations considerably better than they could reject the outdated practices these replace and named this knowledge–practice gap as their leading barrier to future practice. Knowledge rose with clinical exposure but plateaued short of proficiency by the final year. Curricula that explicitly deconstruct legacy practice through simulation, paired with placements that reinforce teaching, offer facilitate from knowing to doing.

Background

Nursing education has long been haunted by a single, uncomfortable observation: what students are taught and what they go on to do at the bedside are not the same thing. The theory–practice gap, first named in these terms decades ago and still the subject of active conceptual and empirical work, describes the persistent divergence between the knowledge nursing curricula transmit, and the competence students and graduates demonstrate in clinical settings.[1] Pressure ulcer prevention is an unusually clean test case for this gap, because the “right answer” is rarely in dispute. Pressure ulcers, also called pressure injuries, bedsores or pressure sores, are localised injuries to the skin and underlying tissue caused by prolonged pressure, particularly over bony prominences such as the sacrum, heels, hips and elbows.[2] Sustained pressure impedes blood flow to tissues, resulting in ischaemia and tissue damage.[3] Immobility, impaired skin status, poor perfusion, inadequate nutrition, moisture, friction and shear are the principal contributing factors.[4] Pressure ulcers are classified into four stages of increasing severity, from non-blanchable erythema of intact skin (Stage 1) through partial-thickness (Stage 2) and full-thickness skin loss (Stage 3) to full-thickness tissue loss with exposed bone, tendon or muscle (Stage 4).[5] Left unaddressed, they extend hospital stays, invite infection and drive up the cost of care.[4]

The scale of that cost is considerable. A systematic review and meta-analysis of more than 2.5 million hospitalised adults reported a pooled pressure injury prevalence of 12.8% and a pooled hospital-acquired proportion of 8.4%;[6] in the United States alone, pressure injuries affect an estimated 2.5 million patients annually at a cost exceeding USD 26.8 billion.[7] The Gulf region carries a comparable burden: a 2024 systematic review and meta-analysis of hospital-acquired pressure injuries across intensive care units of the Eastern Mediterranean region, which includes the UAE, put the pooled prevalence at 16.6%, [8] and serial point-prevalence audits at a major Abu Dhabi medical city recorded a rise in overall pressure ulcer prevalence from 6.4% in 2013 to 10.4% in 2018, even as hospital-acquired prevalence there remained low;[9] comparable figures have been reported in Saudi critical care.[10] Because most pressure ulcers are considered avoidable once risk is properly assessed and acted upon,[11] this rising regional burden is best read not as an indictment of bedside effort but as a signal that prevention knowledge is not yet consistently reaching practice.

The knowledge itself is not exotic. Regular risk assessment with validated tools such as the Braden Scale,[12] pressure relief through repositioning and support surfaces,[13] adequate nutrition and hydration,[14] patient and family education,[15] and multicomponent care bundles [16] together constitute a settled, guideline-concordant prevention framework, now entering its fourth international edition as the evidence base is refreshed.[2, 17] What is less settled is whether this framework, taught, is actually held. Deficits in nurses’ knowledge of pressure ulcer prevention have been documented repeatedly and across health systems,[18, 19] and recent syntheses continue to find the same pattern: a 2022 systematic review and meta-analysis of nurses’ pressure ulcer knowledge worldwide,[20] a 2024 study of intensive care nurses in South Africa [21] and a 2024 multicentre survey of nurses across 93 Chinese hospitals [22] all describe knowledge that falls short of guideline concordance despite pressure

ulcer content being a standard curricular fixture. Among nursing students specifically, the pattern recurs: European and Australian cohorts have shown subgood knowledge with recurring gaps in risk-factor identification, correct use of pressure-relieving devices and patient education,[23, 24] a 2023 meta-analysis pooling nurse and student data on two validated instruments confirms the deficit is not confined to any one country or tool,[25] and a 2024 multiregional study of Saudi nursing interns, arguably the closest comparator to the present cohort, found a mean knowledge score of only 48.15% alongside unsatisfactory attitudes.[26] Notably, an integrative review of how qualified nurses themselves approach patient education on pressure injury prevention found that nurses often feel underprepared to teach what they are expected to have already learned,[27] which suggests the gap identified in students does not simply resolve itself upon graduation.

Clinical exposure and simulation-based learning are the two levers most consistently associated with closing this gap: greater exposure across settings correlates with higher knowledge,[24] and simulation reinforces theoretical content by making students act on it under supervision rather than merely recall it. [28] This is not incidental to nursing alone. The 2010 Lancet Commission on the education of health professionals for the twenty-first century argued that professional curricula worldwide had drifted out of alignment with population health needs, and called for competency-based, systems-oriented reform across medicine, nursing and public health;[29] a 2022 follow-up in the same journal, reviewing the decade since, found competency-based education and simulation had indeed advanced but unevenly, and that translating classroom competence into workplace performance remained the harder half of the reform agenda.[30] Pre-registration education is, in this framing, the single most cost-effective point at which to intervene: it is the window in which correct knowledge can be installed before misconceptions become entrenched by repetition in under-resourced clinical environments. Yet, data on pressure ulcer prevention knowledge among nursing students in the UAE remain anecdotal or limited.

This study aimed to assess knowledge of pressure ulcer prevention among nursing students at a health sciences college in the UAE and to qualitatively explore the barriers students perceive to practising proper pressure ulcer prevention, as well as their own suggestions for closing the gap between what they know and what they can do.

Methods

Design and setting

A descriptive, cross-sectional study with an embedded qualitative component was conducted at Fatima College of Health Sciences (FCHS), a health professions college in the UAE that educates nursing, rehabilitation, pharmacy, paramedic, and radiology and medical imaging students across several campuses. The quantitative component addressed knowledge; open-ended questions captured perceived barriers to prevention practice and suggested improvements. This dual design was chosen deliberately: a knowledge score alone cannot distinguish a genuine information deficit from a gap that

students recognise but cannot close in practice, and only the qualitative arm can surface which of those two problems predominates.

Participants

Nursing students enrolled in the clinical phases of their programme (academic years 2, 3 and 4) at FCHS were invited to participate. A minimum sample size of 129 was determined using the standard finite-population formula

$$n = [DEFF * Np(1-p)] / [(d^2 / Z_{1-\alpha/2}^2 * (N-1) + p*(1-p)]$$

Assuming an anticipated prevalence of good knowledge of $p = 48.15\%$, [26] a finite population, $N = 600$, eligible students, 80 % pwer, $Z_{\alpha} = 1.96$ and a design effect of 1.0. The electronic survey link was subsequently distributed to 150 randomly selected students drawn from the available sampling frame. Of these, 133 returned completed questionnaires, corresponding to an 88.6% response rate. Participation was voluntary.

Instrument

Data were collected using an adapted version of the Pressure Injury Prevention Knowledge questionnaire (PIPK), a validated 31-item instrument.[31] Section A captured demographic and academic characteristics (age, nationality, marital status, year of study, number of clinical placements completed, and emirate of clinical placement). Section B comprised 31 statements on pressure injury prevention recommendations answered as True, False, or Don't know. Following the published scoring key, each correct answer scored one point; "Don't know" and unanswered items scored zero. Total scores range from 0 to 31 and were also expressed as a percentage knowledge index. Knowledge was categorised as good ($\geq 80\%$), moderate (60–79%), or poor ($< 60\%$). Two open-ended questions were asked: "What do you think are the barriers (problems) preventing you from practising proper pressure ulcer prevention strategies?" and "What do you think should be done to improve your knowledge and practice of proper pressure ulcer prevention strategies?" In the present sample, the internal consistency of the 31-item knowledge scale was acceptable (Kuder–Richardson 20 = 0.82).

Data analysis

Quantitative data were analysed descriptively using frequencies and percentages for categorical variables and means, standard deviations (SD), medians and interquartile ranges (IQR) for continuous variables. Item-level performance was described as the percentage of correct and "Don't know" responses. Associations between knowledge scores and participant characteristics were examined using Welch's independent-samples t-test (marital status), one-way ANOVA (year of study; age group), the chi-square test (knowledge category by year of study), and Pearson and Spearman correlations (age; year of study; number of placements). Statistical significance was set at $p < 0.05$.

Responses to the open-ended question on barriers were analysed using reflexive thematic analysis, following Braun and Clarke's six-phase approach:[32–34] familiarisation with the data, generation of initial codes, searching for themes, reviewing themes, defining and naming themes, and producing the report. The analysis was inductive and data-driven, with themes generated from the dataset rather than mapped onto a pre-existing framework; primarily semantic, building themes from the explicit content of responses given the brevity of most entries; and conducted within a broadly contextualist framework, treating responses as reflecting participants' genuine perceptions of barriers while acknowledging the limits of single-question, self-report data. Of the 133 barrier responses, 21 were blank, punctuation-only or otherwise non-substantive and were excluded, leaving 112 substantive responses. Coding was performed manually by a single analyst across the full set of responses, and code frequency counts were cross-checked programmatically against the source text; consistent with the reflexive orientation of the method, inter-rater reliability was not computed.[33] During theme review, candidate themes were checked against the coded extracts and against the full dataset to confirm internal coherence and distinctiveness. Because many respondents cited several barriers, responses could be coded to multiple codes and themes, so frequencies sum to more than 100%.

Responses to the question on suggested improvements were analysed using conventional qualitative content analysis:[35] responses were read repeatedly for familiarisation, meaning units were coded inductively, and codes were grouped into categories. Non-substantive entries were excluded, leaving 112 substantive improvement responses. Illustrative verbatim quotations are presented throughout the results; spelling and grammar irregularities in quotations were retained to preserve authenticity.

Results

Demographic characteristics

A total of 133 nursing students participated. Their mean age was 21.9 years (SD 1.9; median 22), and just over half (52.6%) were aged 21–22 years. Nearly all participants were Emirati (n = 132, 99.2%), and most were single (n = 110, 82.7%). Fourth-year (n = 58, 43.6%) and third-year (n = 44, 33.1%) students predominated. Participants had completed a median of 5 clinical placements (IQR 3–7), most commonly in hospitals in Ajman (31.6%), Dubai (15.8%), and Ras Al Khaimah (15.0%) (Table 1).

Table 1
Demographic and academic characteristics of participants (N = 133)

Characteristic	Frequency	Percentage
Age group (years)		
18–20	26	19.5
21–22	70	52.6
23–25	34	25.6
>25	3	2.3
Nationality		
Emirati	132	99.2
Other	1	0.8
Marital status		
Single	110	82.7
Married	22	16.5
Not stated	1	0.8
Year of study		
Year 1	1	0.8
Year 2	23	17.3
Year 3	44	33.1
Year 4	58	43.6
Not stated	7	5.3
Clinical placements completed		
1–2	24	18.0
3–4	36	27.1
5–6	29	21.8
≥7	36	27.1
Not stated	8	6.0
Emirate of clinical placement		
Ajman	42	31.6

Characteristic	Frequency	Percentage
Age group (years)		
Dubai	21	15.8
Ras Al Khaimah	20	15.0
Sharjah	17	12.8
Umm Al Quwain	8	6.0
Fujairah	4	3.0
Abu Dhabi	2	1.5
Not stated	19	14.3

Knowledge of pressure ulcer prevention

The mean total knowledge score was 19.9 (SD 5.2) out of a possible 31, corresponding to a mean knowledge index of 64.1% (SD 16.6%). The median score was 20 (IQR 16–24; range 0–29). Overall, 27 students (20.3%) demonstrated good knowledge ($\geq 80\%$), 56 (42.1%) moderate knowledge (60–79%), and 50 (37.6%) poor knowledge ($< 60\%$). One participant answered “Don’t know” to all 31 items.

Item-level performance is summarised in Table 2. Students performed best on items describing core, true recommendations: use of devices or fabric to reduce friction and shear during repositioning (91.7% correct), reassessment of risk after a significant change in health status (85.7%), skin areas to assess in the prone position (85.0%), use of validated nutritional assessment tools (84.2%), and comprehensive assessment of every patient for risk factors (83.5%). By contrast, the five worst-answered items were all false statements reflecting common misconceptions: applying hyper-oxygenated fatty acids to protect the skin from moisture (14.3% correct), keeping at-risk bedridden patients semi-recumbent with head elevation of 30–45° (17.3%), using cotton and elastic heel bandages to redistribute pressure (19.5%), allowing up to 48 hours for the comprehensive admission skin assessment (24.8%), and using donut-shaped devices for pressure relief (36.8%). Fewer than half of students also correctly rejected rubbing the skin with alcohol and massaging bony prominences (46.6%). The pattern is consistent: students were considerably more fluent in what they should do than in what they should stop doing.

Table 2
Item-level performance on the PIPK (N = 133)

Item (abbreviated statement)	Key	Correct (%)	Don't know (%)
1. Use device/fabric to reduce friction and shear when repositioning	T	91.7	1.5
2. Offer high-protein, high-calorie supplements to at-risk adults with inadequate intake	T	78.2	4.5
3. Patients can be positioned over reddened skin areas	F	51.9	3.0
4. Reassess risk when significant change in health status occurs	T	85.7	2.3
5. Assess and monitor nutrition using validated tools	T	84.2	2.3
6. Skin under medical devices is not at higher risk	F	54.1	3.0
7. Describe all pressure injuries using a standardised classification system	T	76.7	6.0
8. Cotton/elastic heel bandage redistributes pressure and prevents injury	F	19.5	2.3
9. Use pressure-relieving mattress instead of standard mattress for at-risk bedridden patients	T	82.0	3.8
10. Protect skin under devices with hyper-oxygenated fatty acids and/or foam dressings	T	74.4	5.3
11. Rubbing skin with alcohol and massaging bony prominences enhances circulation	F	46.6	6.0
12. Not necessary to periodically mobilise medical devices	F	57.1	3.8
13. Comprehensive admission skin assessment may be done within first 48 hours	F	24.8	1.5
14. Repositioning unnecessary on a pressure-relief mattress	F	58.6	2.3
15. Adequate seat tilt reduces pressure and shear while sitting	T	78.2	5.3
16. In dark-skinned patients, prioritise temperature, oedema and tissue consistency	T	79.7	4.5
17. Protect skin from moisture by applying hyper-oxygenated fatty acids	F	14.3	6.0
18. Keep at-risk bedridden patients with head elevated 30–45°	F	17.3	8.3
19. Register all risk assessments in the medical record	T	78.2	2.3
20. Assess nutritional status at admission or major change in status	T	77.4	2.3
21. Length of surgery is not a risk factor	F	51.1	4.5

Item (abbreviated statement)	Key	Correct (%)	Don't know (%)
22. Use a donut-shaped device to relieve pressure	F	36.8	6.8
23. Choose pressure-relief mattress by patient characteristics; schedule repositioning accordingly	T	72.9	1.5
24. Consider management devices for incontinence, sweating, exudation or drainage	T	78.9	3.0
25. Do not exceed 30° head-of-bed elevation in bedridden patients	T	59.4	8.3
26. Perform comprehensive assessment of every patient to identify risk factors	T	83.5	3.0
27. Examine skin for redness, non-blanchable erythema, heat, induration, breakdown	T	77.4	3.0
28. Time spent sitting still does not influence development of pressure injuries	F	50.4	2.3
29. In prone position assess face, nose, chin, chest, knees, iliac crests, feet, etc.	T	85.0	2.3
30. Systematically use a validated risk assessment scale (Braden, Norton, EMINA)	T	79.7	3.8
31. Monitor skin in high-risk areas (heels, sacrum, occiput, nose, hips)	T	79.7	3.8

Key: T = statement is true; F = statement is false. Correct answers scored per the published PIPK key [20]. Unanswered items were scored as incorrect.

Factors associated with knowledge

Knowledge scores rose with academic seniority: mean scores were 17.9 (SD = 4.2) among second-year, 20.3 (SD = 4.2) among third-year, and 20.8 (SD 6.0) among fourth-year students. Although the omnibus ANOVA did not reach significance ($F(2,122) = 2.71$, $p = 0.070$), year of study correlated positively with knowledge score (Spearman $\rho = 0.245$, $p = 0.006$), and the distribution of knowledge categories differed significantly across years 2–4 ($\chi^2(4) = 12.46$, $p = 0.014$), with the proportion achieving good knowledge increasing from 4.3% in year 2 to 18.2% in year 3 and 31.0% in year 4. The number of clinical placements completed also correlated positively with knowledge ($\rho = 0.220$, $p = 0.014$). Knowledge was not associated with age ($r = 0.021$, $p = 0.811$; age-group ANOVA $F(3,129) = 0.33$, $p = 0.805$) or marital status (single 20.1 ± 5.4 vs married 18.5 ± 3.8 ; Welch $t = 1.69$, $p = 0.098$) (Table 3). Structured educational and clinical experience, in other words, moved the needle; simply growing older did not.

Table 3
Knowledge scores by participant characteristics

Characteristic	n	Score, mean (SD)	Test; p value
Year of study			F = 2.71; p = 0.070
Year 2	23	17.9 (4.2)	p = 0.245; p = 0.006
Year 3	44	20.3 (4.2)	
Year 4	58	20.8 (6.0)	
Marital status			t = 1.69; p = 0.098
Single	110	20.1 (5.4)	F = 0.33; p = 0.805
Married	22	18.5 (3.8)	
Age group (years)			
18–20	26	19.1 (4.7)	
21–22	70	20.2 (5.7)	
23–25	34	19.9 (4.7)	p = 0.220; p = 0.014
>25	3	18.7 (0.6)	
Placements completed	125	-	r = 0.021; p = 0.811
Age (continuous)	133	-	

One-way ANOVA. Spearman rank correlation with total score. Welch's independent-samples t-test. Pearson correlation. The single first-year student was excluded from ANOVA and chi-square analyses.

Perceived barriers to pressure ulcer prevention practice

Of the 133 responses to the barriers question, 112 were substantive and entered the analysis. Familiarisation showed that response length varied widely, from single words or short phrases ("Time management", "Lack of staff") to multi-sentence reflections listing several compounding barriers, and that recurring vocabulary, time, staff, knowledge and training, equipment, and nurse-to-patient ratio, anchored the coding frame. Ten initial codes were generated (Table 4). Codes were clustered by conceptual similarity into six themes and one deviant case (Table 5): insufficient knowledge or training and lack of clinical practice or experience were combined into a single knowledge–practice gap, as both describe a gap between what students are taught and what they are able to apply at the bedside; staff shortages and high patient-to-nurse ratios were combined into a workforce-capacity theme; burnout (n = 3) was too infrequent to stand alone and was retained as a contributing element of workforce capacity; and the four "no barrier perceived" responses were treated as a deviant case rather than forced into a theme.

Table 4
Initial codes generated from the barrier responses (N = 112)

Initial code	Frequency	%	Illustrative extract
Time pressure / competing clinical duties	57	51	"Lack of time during clinical duties."
Insufficient knowledge, education or training	52	46	"Staff might not be fully educated on pressure ulcer prevention techniques or how to properly assess risk."
Lack of clinical practice or experience	16	14	"Not trained enough to do it alone" / "Lack of clinical practice"
Staff shortages	32	29	"Inadequate staffing"
High patient-to-nurse ratio	23	21	"High nurse to patient ratio"
Lack of equipment / pressure-relieving devices	29	26	"Limited availability of pressure-relieving mattresses, cushions, or other equipment."
Patient-related factors	13	12	"Patient weight" / "uncooperative patients"
Poor communication / documentation	14	13	"Poor documentation and communication"
Burnout	3	3	"Heavy burnout and no proper documentation"
No barrier perceived	4	4	"Nothing" / "Good"

Table 5
Themes describing perceived barriers to pressure ulcer prevention (N = 112)

Theme	Definition	n	%
1. Racing the clock	Time scarcity and competing clinical demands leave insufficient time for repositioning and skin assessment.	57	51
2. Knowing and doing	A two-sided gap between formal knowledge/training and the hands-on practice or experience needed to apply it.	61	54
3. Stretched too thin	Structural workforce capacity limits, staff shortages and high patient-to-nurse ratios, that reduce time and attention available per patient.	48	43
4. Without the right tools	Inadequate access to pressure-relieving mattresses, cushions and other prevention equipment.	29	26
5. The patient in the equation	Patient-level factors, weight, mobility, nutritional status, pain, cooperation, that complicate prevention regardless of staff effort.	13	12
6. Falling through the cracks	Breakdowns in documentation and interprofessional/handover communication.	14	13

Theme 1: Racing the clock (n = 57, 51%)

The most frequently cited single barrier was not having enough time to reposition patients, complete thorough skin assessments, or otherwise carry out prevention protocols amid competing clinical duties:

Lack of time: Healthcare professionals may be overwhelmed with patient care tasks, leading to insufficient time for regular repositioning or thorough skin assessments.

Lack of time during busy shifts, shortage of staff, and not having enough training or reminders about the proper techniques.

Many time-related responses, like the second quotation above, explicitly linked time scarcity to staffing and training, indicating that barriers were experienced as interconnected rather than isolated.

Theme 2: Knowing and doing (n = 61, 54%)

This was the largest theme once related codes were combined, and it names the theory–practice gap in the students' own words. Respondents described a gap with two faces: not knowing enough (formal training and education) and not having done enough (hands-on clinical practice), often naming both together:

Staff might not be fully educated on pressure ulcer prevention techniques or how to properly assess risk.

Lack of experience and opportunities to practise

For a substantial share of respondents, prevention failures were attributed less to unwillingness and more to not yet having the taught knowledge or supervised repetition needed to act confidently.

Theme 3: Stretched too thin (n = 48, 43%)

Respondents frequently pointed to structural workforce constraints, not enough nurses, and too many patients per nurse, as barriers largely outside individual control:

Heavy workload. Inadequate staffing

Improper nurse:patient ratio, no help with patient assessment and time:long shifts

A small number of responses (n = 3) explicitly named burnout as a consequence of this understaffing (e.g., "Heavy burnout and no proper documentation"), reinforcing that workforce capacity was experienced as a root cause feeding into other barriers rather than an isolated issue.

Theme 4: Without the right tools (n = 29, 26%)

A recurring, more concrete barrier was the unavailability of pressure-relieving equipment, including specialty mattresses, cushions, heel protectors, and other support surfaces:

Insufficient resources: Limited availability of pressure-relieving mattresses, cushions, or other equipment can make it difficult to properly manage at-risk patients.

resources (heel protection and special cushion mattresses)

Theme 5: The patient in the equation (n = 13, 12%)

A smaller but distinct set of responses located the barrier in patient-level factors rather than staff or system factors: body weight, comorbid health status, pain, or reluctance to cooperate with repositioning:

Patient health status (nutrition, physical activity...)

Lack of skill and knowledge, uncooperative patients

This theme is analytically distinct from the others because it locates part of the barrier outside staff capacity or resourcing altogether, in the patient's own condition or behaviour.

Theme 6: Falling through the cracks (n = 14, 13%)

Several responses pointed to breakdowns in documentation and in communication, between shifts, across the care team, or in escalating early warning signs, as a barrier distinct from workload or knowledge:

Some nurses ignore early signs or do not document properly

lack of staff, access to updates, resources... documentation and patient compliance as well as communication during handover

Deviant case: Perceived absence of barriers (n = 4, 4%)

Four responses departed from the otherwise consistent pattern of reporting barriers: "Nothing" (×2), "Good", and "Yes". These may reflect genuinely well-resourced practice settings, misreading of the question, or limited critical reflection; the data cannot distinguish between these explanations. They are reported as a minority counter-narrative rather than folded into a theme, consistent with reflexive thematic analysis's attention to variation and deviant cases.

Suggestions for improving knowledge and practice

Content analysis of the 112 substantive improvement responses identified suggestions centred on regular training and continuing education (58.9%), hands-on practice and simulation (35.7%), and ready access to updated guidelines and checklists (22.3%). Students additionally suggested mentorship and supervision from senior nurses and improved staffing. The suggestions were coherent with the barriers identified, most directly addressing the knowledge–practice gap: students who told us they lacked the taught knowledge or supervised repetition to act confidently proposed, almost point for point, the remedy for exactly that.

Discussion

This study set out to test, in a single UAE cohort, whether a nursing curriculum that teaches correct pressure ulcer prevention translates to a nursing workforce equipped to deliver it. The answer the data give is a qualified no. Students achieved a mean knowledge index of 64.1%, and only one in five reached the threshold for good knowledge ($\geq 80\%$). This level is best characterised as moderate and sits squarely within the range reported for nurses and nursing students internationally.[18–20, 22–26, 31] Given that most pressure ulcers are avoidable[11] and that hospital-acquired pressure injury prevalence across the Eastern Mediterranean region, including the UAE, remains high,[8, 9] a knowledge gap of this magnitude in the future workforce is not a curiosity; it is a leading indicator of the prevalence figures that will follow this cohort into practice.

The item-level pattern is the most theoretically interesting finding in the dataset, because it locates the gap with some precision. Students performed well on affirmative, guideline-concordant recommendations, friction and shear reduction, risk reassessment, validated nutritional and risk assessment tools, and comprehensive skin assessment, but performed poorly on items requiring them to reject outdated or harmful practices. Fewer than one in five students correctly rejected heel bandaging and excessive head-of-bed elevation; only a quarter recognised that the admission skin assessment should not be delayed for up to 48 hours; and barely a third rejected doughnut-shaped devices. Nearly half endorsed rubbing the skin with alcohol and massaging bony prominences. These are precisely the practices contemporary international guidance discourages,[2, 5] yet they persist in what students absorb from textbooks, clinical role models or inherited lay belief. Similar misconception-driven error patterns recur in nurses completing the PIPK and comparable instruments,[20, 22, 31] which suggests this is not a quirk of one curriculum or one cohort but a structural feature of how pressure ulcer prevention is taught: positive recommendations are easy to transmit, but unlearning is not, and most curricula are not designed to teach unlearning at all. Educationally, this argues for teaching that explicitly deconstructs legacy practice rather than simply adding correct content on top of it, ideally through case-based and simulation formats in which students must choose against familiar but incorrect interventions.[28, 36]

Knowledge increased with clinical exposure: both the year of study and the number of clinical placements completed correlated positively with knowledge scores, and the proportion of students with good knowledge rose from 4% in year 2 to 31% in year 4. Age and marital status were not associated with knowledge, indicating that structured educational and clinical experience, rather than maturity per se, builds competence, consistent with evidence that specific training and clinical experience are among the strongest determinants of pressure injury knowledge among nurses and nursing students.[18, 24] But the ceiling matters as much as the trend: even final-year students averaged only 67% on the knowledge index. Clinical exposure narrows the gap; it does not close it. This is exactly the pattern described in the wider theory–practice gap literature, where placement experience improves confidence and applied competence but rarely substitutes for structured, guideline-anchored instruction.[1, 37]

The qualitative findings do more than contextualise these numbers; they show students diagnosing their own gap before the data confirmed it. The largest theme was a two-sided knowledge–practice gap (“knowing and doing”), in which students attributed imperfect prevention less to unwillingness than to not yet having the taught knowledge or supervised repetition needed to act confidently; it was followed closely by time scarcity (“racing the clock”) and structural workforce constraints (“stretched too thin”), with equipment shortfalls, communication and documentation breakdowns, and patient-related complexity layered on top. Read together, the themes were not independent: a large share of responses named several barriers in the same breath (e.g., “Lack of time, staff, training and equipment”), suggesting that students experience barriers to prevention as a compounding, systemic problem, insufficient staffing produces time pressure, and time pressure leaves little room for training, supervised practice or careful documentation, rather than as a set of isolated deficits. A recent systematic review of qualitative evidence on the theory–practice gap across nursing services found the same clustering, clinical-life pressures, misconceptions about what clinical nursing actually involves, and weak collaboration between universities and clinical placements, and pointed to co-designed, clinically grounded curricula as the most consistently proposed remedy.[37] These barriers also closely mirror those reported by qualified nurses internationally, among whom shortages of pressure-relieving devices, heavy workload and lack of training are the most commonly reported impediments to prevention practice,[27, 38] suggesting that students are already internalising, during placements, the same organisational impediments that constrain registered nurses. Resource limitations in clinical settings are a recognised barrier to guideline implementation, and advocacy for adequate staffing, equipment and training is necessary to overcome them.[38] Their proposed remedies were coherent with the identified barriers: regular training and continuing education, simulation and supervised hands-on practice, ready access to current guidelines and checklists, mentorship from senior nurses, and improved staffing. The specificity of some suggestions, for example, checklist-based reminders and reference to international guideline bodies, indicates a readiness among students to engage with structured, evidence-based prevention systems, and a recent systematic review of clinical simulation in nursing education, published in this journal, reports exactly the competency gains, in decision-making, confidence and knowledge transfer, that such engagement would be expected to produce.[36]

The findings have several implications that follow directly from where the gap was shown to lie. First, nursing curricula should explicitly embed the current international pressure injury prevention guideline, with assessment items that target known misconceptions rather than only testing recall of correct statements.[2] Second, simulation-based education, repositioning technique, support-surface selection, skin assessment, including dark skin tones, and device-related injury prevention should be expanded, echoing both students’ own requests and broader evidence that simulation improves knowledge, skills, and confidence by forcing a choice against familiar but incorrect practice.[28, 36] Third, clinical partners should be engaged so that placements reinforce, rather than undermine, guideline-concordant practice through adequate equipment, supportive supervision and visible documentation systems,[38] since a curriculum cannot close a gap that clinical placements keep reopening. Fourth, teaching should encompass patient and family education as an explicit prevention competency, given its centrality to

effective prevention [15] and its appearance in students' own suggestions. Fifth, and consistent with the broader case for competency-based, quality-and-safety-anchored curricula in nursing,[39] periodic knowledge audits using validated instruments such as the PIPK could track the effect of curricular changes over time.[31] None of this is a call for more content; it is a call for content designed around the specific shape of the gap this study has mapped, which is squarely consistent with the wider argument that health-professional education, a decade on from the 2010 Lancet Commission, still needs to close the distance between what is taught and what health systems actually need delivered at the bedside.[29, 30]

Limitations

This study had some notable limitations. It was conducted at a single college, with participants drawn predominantly from a single campus, which limited generalisability. The cross-sectional design precludes causal inference regarding the association between clinical exposure and knowledge. Self-selection of respondents may have biased the sample. Practice of pressure ulcer prevention was explored only through self-reported open-ended responses rather than observed or measured behaviour, so what students say the barriers are cannot be taken as direct evidence of what they actually do at the bedside. Open-ended written responses were often brief, constraining the reflexive thematic analysis largely to the semantic level and limiting the latent, interpretive depth possible with interview data.

Conclusions

Students demonstrated moderate knowledge of pressure ulcer prevention, with pronounced misconceptions concerning outdated practices such as heel bandaging, doughnut devices, massage of bony prominences, and delayed admission skin assessment, and named a knowledge–practice gap as the single largest barrier to their own future prevention practice. Knowledge improved with years of study and clinical placement experience, but remained below the good-knowledge threshold for most students even at graduation. Students identified training deficits, time and staffing constraints, and limited equipment as the principal barriers to prevention practice, and called for regular training, simulation-based learning, accessible guidelines, and supportive supervision, a set of remedies that maps closely onto the gap the quantitative data independently revealed. Strengthening guideline-based, simulation-supported pressure injury education within the nursing curriculum, delivered through clinical learning environments equipped and staffed to reinforce rather than dilute it, is the most direct route from knowing to doing. As the workforce expected to prevent this largely preventable harm, student nurses need that route built for them well before they graduate.

Abbreviations

ANOVA

Analysis of variance

EPUAP

European Pressure Ulcer Advisory Panel
FCHS
Fatima College of Health Sciences
IQR
Interquartile range
NPIAP
National Pressure Injury Advisory Panel
PIPK
Pressure Injury Prevention Knowledge questionnaire
PPPIA
Pan Pacific Pressure Injury Alliance
SD
Standard deviation
UAE
United Arab Emirates

Declarations

Ethics approval and consent to participate

This study was approved by the Fatima College of Health Sciences Research Ethics Committee (Reference No: FECE-2-24-25-D.MUKONA2) and was conducted in accordance with the Declaration of Helsinki. Written informed consent was obtained from all participants. Participation was voluntary, confidentiality and anonymity of responses were maintained, and non-participation carried no academic consequences.

Consent for publication

Participants provided consent to publish the findings. No individually identifying data are reported.

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Author Contribution

DM conceptualised the study, led the investigation and analysis, provided the project oversight, and authored the original draft with subsequent review and editing. RFM, MZ, and AN developed the methodology, reviewed the analysis, drafted and edited the manuscript. All authors reviewed and approved the final manuscript and agree to be accountable for all aspects of the work.

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Data Availability

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

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