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ORIGINAL RESEARCH

Assessment of Registered Nurses' Knowledge of Pressure Injury Prevention and the Impact of Training Recency: A Cross-Sectional Study

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Purpose: This study evaluated nurses' knowledge of pressure injury (PI) prevention in adult care settings using the Pressure Injury Prevention Knowledge (PIPK) tool, designed to measure prevention-focused knowledge. The study aimed to identify gaps in practice, as knowledge deficits remain insufficiently explored despite existing training programs.

Methods: A cross-sectional study was conducted from January to April 2025 at a public hospital in the Makkah region of Saudi Arabia, involving registered nurses in adult care units. A two-part questionnaire was administered to collect demographic and professional information, including recent training exposure, and to assess PI prevention knowledge using the PIPK tool. Nurses were grouped according to the recency of their training, and comparative analysis was performed to evaluate differences in PIPK scores between these groups.

Results: A total of 194 registered nurses participated, with 52.57% having 5 to 10 years of clinical experience. Slightly more than half had received recent formal training on PI prevention, while fewer engaged in self-directed learning. The average PIPK knowledge score was 72%, below the 75% sufficiency threshold. Nurses trained within the past year scored significantly higher than those trained over two years ago, indicating that recent training is linked to better knowledge of PI prevention.

Conclusion: The PIPK questionnaire, developed from international PI prevention guidelines and originally validated in Spanish, showed response patterns in this study comparable to the original validation. Nurses' knowledge was found to be below the sufficient threshold, indicating a gap that may hinder consistent preventive practices. These findings highlight the importance of contextual validation of assessment tools and the need for updated training programs. Notably, nurses trained within the past year scored significantly higher, emphasizing the role of continuous education and guideline updates in strengthening prevention practices.

Keywords: pressure injuries, patient care, prevention strategies, nurses training, pressure injury prevention knowledge, nurse education, hospital-acquired pressure injuries

Introduction

Pressure injuries (PIs), or bedsores, are lesions of the skin and underlying tissue that typically develop over bony prominences due to continuous pressure, often accompanied by friction and shear forces. Common sites include the heels, ankles, hips, and tailbone, where limited soft tissue cushioning and prolonged pressure compromise blood flow, leading to tissue ischemia, cell death, and subsequent skin damage.[1–3] Despite improved understanding of prevention and care strategies, PIs remain a persistent issue, particularly among individuals with reduced mobility and limited ability to reposition, which significantly increases the risk of skin and tissue breakdown.[4,5] Efforts to quantify the burden of PIs have yielded varying estimates. Hospital-acquired pressure injuries (HAPIs) remain a global concern, with meta-analytic data indicating a prevalence of 12.8% and an incidence rate of 8.4%. In acute care settings, prevalence rates have been reported to range from 6% to 18.5%, underscoring the ongoing difficulty of preventing PIs in critically ill patients.[6,7] More recently, a study focused on intensive care units (ICU) in the Eastern Mediterranean region reported 16% prevalence of HAPI, highlighting the considerable challenge of prevention among critically ill patients in that region.[8]

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While these global and regional findings highlight the burden of PIs, evidence from Saudi Arabia suggests a similarly significant problem, underscoring the need for context-specific insights.

Published data on PI epidemiology in Saudi Arabia also indicate a notable prevalence of PIs among hospitalized patients. A multi-centre pre-post intervention study conducted in the critical care units of three hospitals across distinct geographical regions in the Saudi Arabia reported an initial PI prevalence of 60.9%, of which 52.9% were hospital-acquired.[9] Another cross-sectional study conducted in 30 medical wards of public general hospitals in Makkah found that 17.6% cases had PIs.[10] Similarly, a cross-sectional study at King Abdullah Medical City in Makkah found a PI prevalence of 11.4% among home care patients (mean age 69.6 ± 14.9 years).[11] These findings emphasize the critical need for early detection and prevention of PIs, which can significantly reduce patient discomfort, lower healthcare costs, and potentially prevent life-threatening complications.

Nurses contribute significantly to PI prevention by carrying out timely assessments and initiating appropriate measures. However, multiple investigations have identified substantial knowledge gaps among nursing personnel, which may act as a barrier in PI prevention.[12–14] A meta-analysis of studies published between 2011 and 2022 using the Pressure Ulcer Knowledge Assessment Tool (PUKAT) found that nurses had an average score of 51.5%, indicating inadequate knowledge of PI prevention.[15] A similar pattern was observed among critical care registered nurses at a Midwestern US hospital, where limited knowledge was reported. The research was conducted using the Pieper-Zulkowski Pressure Ulcer Knowledge Test (PZ-PUKT).[16]

Consistent with these international findings, research conducted in Saudi Arabia has likewise revealed knowledge gaps among nurses. A cross-sectional study by Asiri and Alqahtani (2022), involving 162 ICU nurses across three hospitals in Riyadh, revealed that while participants demonstrated positive attitudes toward PI prevention, with an average attitude score of 41.8 (SD ± 4.5) out of a maximum score of 52, and expressed strong intentions to prevent PI, their overall knowledge was lacking, with a mean knowledge score of 12.7 (SD ± 3.0) out of a total score of 26.[17] Likewise, findings from four hospitals (two public and two private) using PUKAT 2.0 confirmed these gaps, as ICU nurses demonstrated an overall knowledge score of 39.55 ± 8.84 out of 100, a level considered low based on the 60% cutoff.[18] Given the limited data and consistent knowledge deficits, further work in collecting and analyzing data on nurses' understanding and their adherence to PI prevention protocols is crucial. This is crucial for improving overall healthcare quality and cost-effectiveness of hospitals in Saudi Arabia. Encouragingly, a recent intervention study demonstrated significant improvements in knowledge and attitudes of nurses following participation in a customized and evidence-based educational program.[19] Moreover, a survey by Altunbakti et al involving 104 inpatient and intensive care nurses at Hera General Hospital in Makkah highlighted the critical role of strong managerial and organizational backing in the effective prevention of PIs.[20]

In light of these findings, the present study aims to assess registered nurses' knowledge regarding PI prevention in a public hospital in Makkah province, Saudi Arabia. It also seeks to examine the impact of the interval since last training on participants knowledge levels. Using a cross-sectional design and applying the PIPK questionnaire, this research intends to provide evidence-based insights to guide future strategies in clinical education and hospital policy within Saudi Arabia.

The PIPK questionnaire was preferred for this study because it focuses exclusively on prevention, offering a more accurate measure of prevention-related knowledge than other commonly used tools that also assess broader areas such as staging, treatment, and wound management.[13,21–23] Its systematic development, based on 414 recommendations drawn from seven internationally recognized prevention guidelines, ensures strong content validity. Moreover, the PIPK includes items specifically designed to identify common misconceptions arising from tradition and knowledge gaps, offering a more accurate reflection of clinical understanding.[21] These features make the PIPK particularly well-suited for assessing prevention-related knowledge among registered nurses in clinical settings.

To our knowledge, this study is the first to apply the PIPK questionnaire among registered nurses in Saudi Arabia. Although educational interventions are known to affect nurses' knowledge of PI prevention, few studies have examined the impact of training recency in this region. By categorizing participants based on the time elapsed since their last in-service lecture, this study offers novel insights into this understudied factor and could contribute to shaping future initiatives aimed at strengthening nurses' knowledge and enhancing patient care quality.

Materials and Methods

Study Sample and Design

To assess their knowledge of PI prevention protocols, this cross-sectional study included a convenience sample of 194 registered nurses working in a public hospital in the Makkah province of Saudi Arabia. Sample size estimation was conducted using G*Power version 3.1.9.7.[24] A priori power analysis for a two-tailed *t*-test, with a medium effect size (Cohen's d = 0.5), alpha of 0.05, and power of 0.80, indicated that a minimum of 132 participants was required.

Inclusion and Exclusion Criteria

The study included registered nurses who were at least 18 years old, working in adult care units (ACU), and willing to participate. Participants were selected from a public hospital in the Makkah province of Saudi Arabia. Those not fulfilling these norms were excluded.

Data Collection

Data were collected using an in-person questionnaire consisting of two sections. The first section captured demographic and professional characteristics, including age, gender, education level, and years of experience, and assessed prior training status. Prior training in PI prevention was defined as participation in either in-service lectures or self-directed learning activities.

For in-service lectures, participants indicated whether they had attended within the past year, between one and two years ago, or more than two years ago. This categorization was based on hospital policy, which provides in-service training opportunities every year but requires nurses to attend at least once every five years, in addition to the mandatory orientation provided at the time of employment. Owing to the small proportion of participants in the one-to-two-year group (~3%), this category was excluded from the final analysis.

Participants were also asked whether they had engaged in self-directed training, such as reviewing updated guidelines or research articles, within the past year or more than one year ago. Because all nurses were required to undergo in-service training, self-directed training was considered an additional voluntary activity. This approach enabled us to examine not only the recency of mandatory training but also whether supplementary self-directed efforts were associated with higher knowledge levels.

The second section assessed PI prevention knowledge using the international version (in English) of the psychometrically validated 31-item Spanish PIPK questionnaire developed by López et al.[21] Each item consisted of a True/False statement regarding whether specific action is recommended by international guidelines. Responses were used to calculate an overall knowledge score.

Assessment of PI Prevention Knowledge

The data collected from PIPK questionnaire were subjected to scoring as described by López et al.[21] Briefly, each correct response was awarded 1 point, while incorrect or "don't know" answers received 0 points. The knowledge score (as a percentage) was then calculated using the following formula:

(Total score/31) X 100

As there is no universally accepted cut-off score for the PIPK questionnaire, this study adopted a 75% threshold to define sufficient knowledge, reflecting the level expected of registered nurses responsible for applying evidence-based practices in PI prevention.

In addition, each item's difficulty score, as reported by López et al,[21] was used to indicate the relative challenge of each question. These scores were derived using the Rasch model, a standard psychometric method that quantifies how challenging each item is for participants' knowledge. Higher scores represent more difficult items. In our study, these difficulty scores were plotted against the percentage of participants answering each item correctly. This approach allowed us to explore the relationship between item difficulty and response accuracy in our sample and to examine whether the relative challenge of items in the original questionnaire was consistent in our population.

Data Analysis

The collected data were compiled in an Excel spreadsheet and analysed using IBM Statistical Package of the Social Sciences Program statistical software (SPSS) version 21. Descriptive statistics were used to summarize nurses' demographic and professional data. For in-service training, although data initially included three groups based on lecture attendance timing, one group (between one to two years) had very few participants (only ~3%). Therefore, the analysis was restricted to two groups: those who attended within the past year and those who attended more than two years ago. Similarly, for self-guided training, participants were categorized into two groups: those who had undergone training within the past year and those who had done so more than one year ago.

As our data did not meet the assumption of normality, the Mann–Whitney *U*-test was applied to compare median knowledge scores between the groups for both training types. Associations between knowledge scores and other participant characteristics were assessed for age and years of experience using Spearman's rank correlation; gender and education were excluded due to marked imbalance in subgroup sizes. A p-value of <0.05 was considered statistically significant for all analysis.

Results

Characteristics of Participants

A total of 194 forms submitted by registered nurses were analysed to assess their knowledge of PI (PI) prevention. All participants were from single public hospital in the Makkah province of Saudi Arabia at the time of study. The mean age was 33.70 years (SD ± 4.26), and the majority were female (84.02%). Over half (52.57%) had between 5 and 10 years of clinical experience. Most participants held a bachelor's degree (90.20%), while 6.70% had a diploma and 3.09% had a master's degree. In terms of training exposure, 55.15% of participants had attended a PI prevention lecture within the past year, 3.09% between one and two years ago, and 41.75% more than two years ago. Additionally, only 37.11% had read updated PI guidelines or articles in the past year, while 62.88% had not engaged with such literature for over a year (Table 1).

Table 1 Characteristics of Participants

Variable	**Value**
Age	33.70 (SD ± 4.26)
Gender	
Male	31 (15.97%)
Female	163 (84.02%)
Number of years in practice	
0 – 5 years	35 (18.04%)
5 – 10 years	102 (52.57%)
10 – 15 years	33 (17.01%)
>15 years	24 (12.37%)
Education	
Diploma	13 (6.70%)
Bachelor	175 (90.20%)
Master	6 (3.09%)

(*Continued*)

Table 1 (Continued).

Variable	Value
Attend lecture on PI – In-service	
Last year	107 (55.15%)
Within two years	6 (03.09%)
Before two years	81 (41.75%)
Reading update PI guideline or article	
Less than one year	72 (37.11%)
More than one year	122 (62.88%)

These findings indicate that while just over half of the nurses had received recent formal training on PI prevention, far fewer engaged in ongoing self-directed learning through current literature.

Knowledge of PI Among Registered Nurses

The responses to the PIPK questionnaire submitted by registered nurses are summarized in Table 2. The average knowledge score was 22.32 out of 31 (72%), below the 75% threshold considered sufficient. To better understand the results, we examined performance on individual questions, as the 31 items in the PIPK questionnaire vary in difficulty. Figure 1 presents a scatter plot showing the relationship between question difficulty and the percentage of correct responses.

Table 2 Response Data of Nursing Participants – PIPK Questionnaire[21]

Statement	True	False	I Do Not Know	Percent Correct	Difficulty
1. When repositioning the individual in bed, use some device or fabric to reduce friction and shear forces and avoid dragging on the bed surface. (T)	187	0	7	96.39	−1.40
2. Offer high-protein, high-calorie nutritional supplements to adults at risk for PIs if dietary intake does not meet nutritional requirements. (T)	165	25	4	85.05	−0.36
3. When repositioning in bed, patients can be placed over reddened skin areas. (F)	42	152	0	78.35	0.11
4. Reassess the risk of PIs when a significant change in patient health status, or clinical situation happens. (T)	187	3	4	96.39	−1.77
5. Assess and monitor nutrition using some validated assessment tools, in a way appropriate to the population and clinical context. (T)	183	0	11	94.32	0.31
6. Skin areas in contact with medical devices (such as masks or tubes) do not have a higher risk for developing PIs. (F)	67	127	0	65.46	−0.09
7. Describe all PIs using a standardized classification system. (T)	187	4	3	96.39	0.22
8. A cotton and elastic bandage on the heels allows redistributing the pressure and preventing PIs. (F)	123	67	4	34.53	3.25
9. In bedridden patients at risk of PIs, a mattress with pressure- relieving properties should be used instead of a standard mattress. (T)	190	4	0	97.93	−3.07

(*Continued*)

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Table 2 (Continued).

Statement	True	False	I Do Not Know	Percent Correct	Difficulty
10. The skin in contact with medical devices (such as drains or tubes) should be protected by using hyper-oxygenated fatty acids and/or foam dressings. (T)	169	21	4	87.11	−1.00
11. Rubbing the skin with alcohol and massaging over bony prominences is useful to enhance capillary circulation. (F)	74	95	25	48.96	1.48
12. It is not necessary to periodically mobilize medical devices (such as masks or tubes) to prevent PIs. (F)	67	113	14	58.24	−0.56
13. A comprehensive skin assessment (head to toe) of all patients admitted to a facility (hospital or nursing home) may be done within the first 48 hours after admission. (F)	78	113	4	58.24	2.72
14. Repositioning is not necessary in bedridden patients using a pressure-relief mattress. (F)	21	173	0	89.17	−0.04
15. The seat tilt should be adequate to reduce pressure and shear forces on the skin in at-risk patients while sitting. (T)	134	46	14	69.07	−1.01
16. In dark-skinned patients, skin assessment should prioritize skin temperature, presence of oedema and change in tissue consistency, instead of the appearance of non-blanchable redness. (T)	148	42	4	76.28	1.50
17. Protect the skin from moisture by applying hyper-oxygenated fatty acids. (F)	141	28	25	14.43	4.40
18. In at-risk bedridden patients, keep semi-incorporated with head elevated between 30° and 45°. (F)	152	31	11	15.97	3.83
19. All risk assessments performed must be registered in the patient's medical record. (T)	190	0	4	97.93	−2.40
20. Nutritional status should be assessed when the patient is admitted to a health facility or a major change in his/her health status happens. (T)	187	0	7	96.39	0.14
21. Length of the surgery is not a risk factor for the development of PIs. (F)	64	95	35	48.96	0.82
22. Use a donut-shaped device to relieve the pressure in at-risk patients with reduced mobility. (F)	159	28	7	14.43	2.71
23. Use the most appropriate pressure relief mattress based on the patient's characteristics, scheduling repositioning accordingly. (T)	127	63	4	65.46	−1.65
24. In patients with incontinence, profuse sweating, wound exudation or drainage, consider the use of appropriate management devices (such as urinary catheters, diapers or dressings). (T)	190	4	0	97.93	−1.86
25. In bedridden patients, do not exceed 30° in the elevation of the head. (T)	60	127	7	30.92	2.12
26. Perform a comprehensive assessment in every patient to identify risk factors for PIs. (T)	172	15	7	88.65	−0.40
27. Examine the skin for signs of redness, areas of non-blanchable erythema, localized heat, induration, or skin breakdown in individuals at risk for PIs. (T)	194	0	0	100	−2.41
28. The amount of time an individual spends sitting still does not influence the development of PIs. (F)	71	113	10	58.24	−1.03

(*Continued*)

Table 2 (Continued).

Statement	True	False	I Do Not Know	Percent Correct	Difficulty
29. In patients in bed in the prone position, the face, nose, chin, forehead, cheekbones, chest, knees, fingers, genitals, clavicles, iliac crest, symphysis and back of both feet should be assessed. (T)	179	11	4	92.26	−0.40
30. Systematically use a validated risk assessment scale (Braden, Norton or EMINA). (T)	172	11	11	88.65	−2.41
31. In bedridden patients, monitor the skin in high-risk areas for PIs (such as the heels, sacrum, occipital, nose, and hips). (T)	194	0	0	100	−1.03

Notes: Each statement in the first column is a knowledge item from the PIPK questionnaire. The correct answer is indicated in brackets as T (true) or F (false). The table presents the distribution of participant responses ("Yes", "No", and "Don't know") and the percentage of participants who selected the correct answer, reflecting their knowledge of PI prevention recommendations. The difficulty column indicates item difficulty ranging from −3.07 (easiest) to 4.40 (hardest). Adapted from López-Franco MD, Parra-Anguita L, Comino-Sanz IM, Pancorbo-Hidalgo PL. Development and Psychometric Properties of the Pressure Injury Prevention Knowledge Questionnaire in Spanish Nurses. *Int. J. Environ. Res. Public Health*. 2020;17(9): 3063[21].

Overall, the data revealed an inverse trend: items with lower difficulty scores (less challenging items) were associated with higher accuracy, whereas items with higher difficulty scores (more challenging items) were answered correctly by fewer participants. Questions such as Q1, Q2, Q4, Q5, Q7, Q9, Q10, Q19, Q20, Q24, Q26, Q27, Q29, Q30, and Q31, ranging from very easy to moderately difficult, were answered correctly by 85% to 100% of nurses. Notably, Q27 and Q31 had a 100% accuracy rate. In contrast, more challenging questions like Q17, Q18, and Q22 saw correct response rates between 10% and 20%. Q17 had the highest difficulty score in the original questionnaire and, consistent with this, was also the least correctly answered question in our study, with only 14% of participants responding accurately. Interestingly, some questions classified as relatively easy such as Q12, Q15, Q23, and Q28, had accuracy rates of just 55% to 70%. Most of the remaining questions, falling into the moderately difficult to difficult range, had correct response rates below 75%.

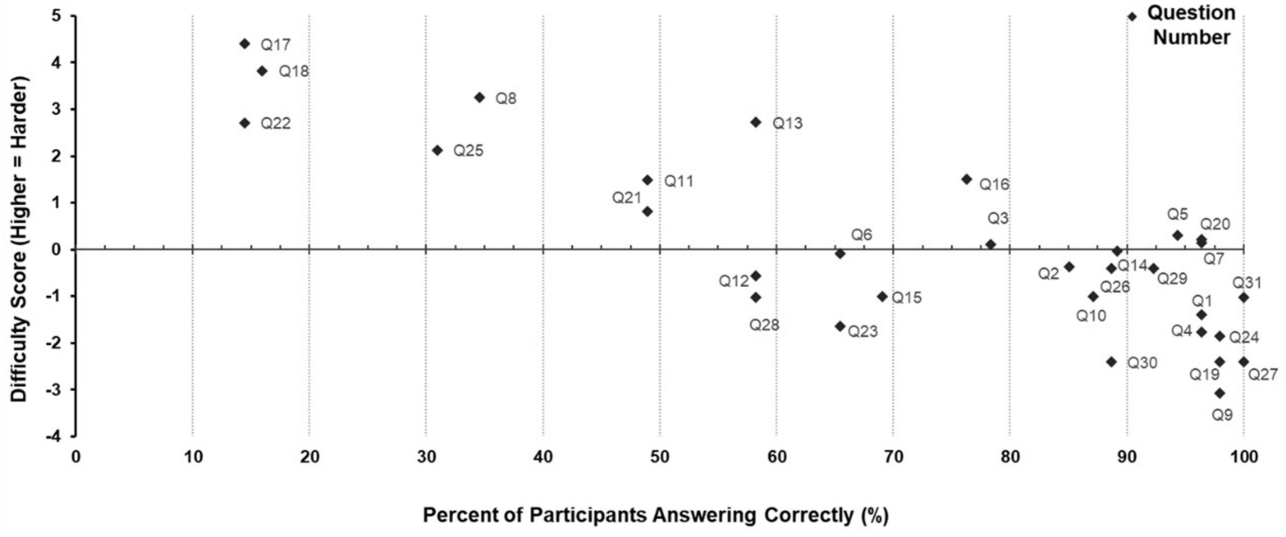

Figure 1 Scatter plot illustrating the relationship between difficulty scores of the PIPK-31 items (as reported by López et al[21]) and the percentage of nursing participants who answered them correctly. Items with lower difficulty scores (less challenging) were associated with higher accuracy, whereas items with higher difficulty scores (more challenging) were answered correctly by fewer participants.

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Impact of Training Recency on Knowledge Levels

The effect of in-service training recency on knowledge levels was assessed by comparing participants who had attended PI prevention training within the past year with those trained more than two years ago. A significant difference was observed ($U = 7361.5$, $p < 0.001$, $r = 0.80$), with median knowledge scores of 19/31 (61.29%) for the recently trained group and 10/31 (32%) for the group trained more than two years ago, indicating higher knowledge among participants with more recent training. In contrast, no significant difference was found when participants were categorized based on whether they had engaged in self-directed activities within the past year or more than a year ago ($U = 4190.0$, $p = 0.53$, $r = –0.05$).

Knowledge levels also showed no significant association with age (Spearman's $\rho = 0.12$, $p = 0.09$) or years of experience (Spearman's $\rho = –0.10$, $p = 0.15$). Assessment by gender and education was limited due to marked subgroup imbalances, as the majority of participants were female, and most held a bachelor's degree.

Discussion

Registered nurses play a critical role in direct patient care and must maintain adequate knowledge to ensure effective PI prevention and management. Their continuous contact with patients positions them well to identify individuals at risk for PIs.[25–27] However, inadequate knowledge remains a significant barrier to prevention, often linked to limited in-service training and the absence of clear guidelines for risk assessment and preventive practices.[12,28–30] In this context, evidence from previous studies suggests that training programs can enhance nurses' competencies.[31,32]

The present study assessed the knowledge of registered nurses regarding PI prevention at a public hospital in Makkah province, Saudi Arabia, and examined how the recency of training influences their understanding of PI prevention strategies. Regarding participants' demographic characteristics, the mean age was 33 years, with nearly 80% possessing over five years of clinical experience, and approximately 30% having more than ten years, indicating a generally experienced group. Approximately 55% of participants reported receiving training on PI prevention within the past year, while a smaller proportion (~37%) engaged in self-directed learning by reviewing updated guidelines during the same period. This points to a potential gap between structured in-service education and continuous knowledge updating, which may affect the depth and retention of PI prevention practices.

This limited engagement in self-directed learning may be partly attributed to educational background, as only around 3% of participants held a master's degree. Prior research by Emblen and Gray found that nurses with master's-level education engage in significantly more self-directed learning than those with only a bachelor's degree.[33] Similarly, other studies conducted among nurses have shown that those with higher educational qualifications demonstrate greater readiness for self-directed learning.[34,35] However, contradictory evidence exists in the literature, and other factors, such as working environment and personality traits, may also influence nurses' involvement in self-directed learning.[35,36] These considerations may help explain the notable gap observed in our data between the proportion of nurses with a master's degree and those actively participating in self-directed learning.

The PIPK questionnaire developed by López et al is designed to assess knowledge related to PI prevention among registered nurses and demonstrates good psychometric properties. The questionnaire includes a broad range of item difficulty, from the easiest (Question 9, difficulty score: –3.07) to the most challenging (Question 17, difficulty score: 4.40), making it effective for distinguishing between individuals with varying knowledge levels.[21] Consistent with expectations, our findings showed higher accuracy on very easy to moderately difficult questions and lower accuracy on more challenging items, reflecting a general trend of decreasing response accuracy with increasing item difficulty. Although originally developed for Spanish nurses, the PIPK questionnaire appeared consistent in assessing PI prevention knowledge in this hospital setting and may hold promise for broader application in Saudi Arabia.

The overall mean knowledge score calculated from the responses was 72%, slightly below the 75% benchmark typically considered sufficient for frontline caregivers, suggesting a gap in preparedness. Importantly, a significant difference was observed between participants who had attended in-service PI prevention training within the past year and those trained more than two years ago, reinforcing the value of regular refresher training. In contrast, no significant differences were found when knowledge levels were compared based on engagement in self-directed activities, nor were they associated with demographic characteristics such as age or professional experience. These findings highlight the

central role of structured training in sustaining knowledge, while also indicating that individual efforts may be less influential. Given the limited regional data on nurses' knowledge of PI prevention, this study provides valuable insights. By using a targeted questionnaire, it offers a precise assessment of current knowledge levels and highlights the positive impact of recent training.

Scope for Future Studies

To our understanding, this study represents the first application of the PIPK questionnaire in assessing PI prevention knowledge among nurses in Saudi Arabia. The PIPK tool not only works well in overall assessing nurses' current knowledge and awareness regarding PI prevention but also in identifying specific knowledge gaps and training needs. This valuable insight can guide targeted educational interventions, ultimately contributing to improved nursing practices and better patient outcomes. Consequently, this study lays a solid foundation for future research focused on enhancing PI prevention strategies by utilizing the PIPK questionnaire, undertaking psychometric validation in the Saudi context, and expanding its application to assess nurses' knowledge across other regions within Saudi Arabia's healthcare settings. Further, these findings highlight the importance of considering training recency as a key variable in future studies on nurses' knowledge of PI prevention, and may help guide the design of more targeted educational interventions and policies aimed at improving patient outcomes.

Limitations

Although the PIPK questionnaire performed well in our study and demonstrated a clear negative association, it is important to note that it was originally developed and psychometrically validated among Spanish nurses, with an internationally adapted version. To strengthen its applicability in Saudi Arabia, future research should focus on cultural and linguistic adaptation within the Saudi healthcare context, including psychometric and content validity testing with local experts. In addition, this study is limited by its use of a convenience sample drawn from a single public hospital in Makkah province, Saudi Arabia. Broader data collection across diverse healthcare settings and regions is recommended to enhance the generalizability of the findings and to support the development of evidence-based national strategies aimed at improving PI prevention practices.

Conclusion

The findings indicated that the PIPK questionnaire, originally developed for Spanish nurses, functioned appropriately in the Saudi Arabian context. A clear negative correlation was observed between question difficulty and response accuracy, ie, less challenging questions tended to yield higher accuracy rates suggesting that the relative challenge of items in our sample was generally consistent with that reported in the original questionnaire by López et al.[21]

An overall insufficient mean knowledge score of nurses indicates a gap that may hinder consistent implementation of effective PI prevention, emphasizing the need for ongoing training and education. Notably, nurses who had received training within the past year scored significantly higher, underscoring the critical role of regular, updated training in improving knowledge related to PI prevention. Taken together, these findings contribute to the current understanding of nurses' knowledge levels in the Makkah region and supports the implementation of regular educational interventions.

Abbreviations

PIs, pressure injuries; PIPK, pressure injury prevention knowledge; HAPI, hospital-acquired pressure injuries; ICUs, intensive care units; PUKAT, pressure ulcer knowledge assessment; SD, standard deviation.

Ethics Approval and Consent to Participate

Approval to conduct the study was obtained from the Institutional Review Board in Makkah Region, Ministry of Health, Saudi Arabia (IRB# H-02-k-076-0125–315) prior to the commencement of the primary research. Informed consent was obtained from all participants, with their voluntary submission of responses considered as an indication of agreement to participate. The purpose of the study was clearly explained, and participants were made aware that their involvement was voluntary. Participants' personal details were not collected to uphold privacy and confidentiality.

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Disclosure

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