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Original Article

Predictors of evidence-based pressure ulcer prevention behaviors among recently graduated nurses in tertiary care hospitals in Lahore

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Abstract

Pressure ulcers (PUs) remain a critical and preventable challenge in hospital care, especially in resource-constrained settings. Despite formal training, early-career nurses often experience gaps in applying evidence-based PU prevention practices. This study identified the behavioral and contextual predictors of evidence-based PU prevention behaviors among recently graduated nurses in tertiary care hospitals in Lahore, Pakistan, by assessing their level of knowledge, attitudes, and self-efficacy, as well as the impact of clinical exposure, internship training, and perceived barriers to preventive practices. An exploratory design involving 135 BSN graduates who had completed their clinical internships within the past six months were recruited for the study using a purposive sampling method. Data were collected via a structured, self-administered questionnaire composed of validated tools, including the Pressure Ulcer Knowledge Assessment Tool 2.0, the Attitude toward Pressure Ulcer Prevention (APuP) scale, and constructs derived from the Theory of Planned Behavior framework. Descriptive statistics, Spearman correlations, and multiple linear regression were used for analysis. While participants showed moderately positive attitudes and self-efficacy, only knowledge of PU prevention emerged as a statistically significant predictor of evidence-based behavior ($p = 0.003$). Other factors, such as attitudes, perceived barriers, and clinical decision-making ability, did not significantly influence behavior. Despite high exposure to PU cases, most participants reported limited workshop participation and demonstrated low decision-making accuracy. This study highlights that factual knowledge, rather than attitudinal or perceptual factors, plays a pivotal role in shaping evidence-based PU prevention behavior among newly graduated nurses. This finding emphasizes the need for knowledge-intensive interventions and scenario-based training in early clinical practice. Further longitudinal studies are recommended to evaluate the impact of mentorship and institutional support on sustained preventive behaviors.

Keywords

Pressure ulcer; Evidence-based practice; Health knowledge, attitudes, practice; Nursing behavior; Clinical competence

1. Introduction

Pressure ulcers (PUs), also known as pressure injuries or decubitus ulcers, remain significant and preventable complications in healthcare settings globally [1]. These lesions result from sustained pressure over bony prominences, leading to ischemia, tissue necrosis, pain, and a heightened risk of systemic infection. The global prevalence of PUs in hospitalized patients ranges from 4% to 38%, and PUs are widely regarded as indicators of care quality, particularly in long-term and critical care settings [2]. In addition to

physical harm, PUs are associated with emotional distress, extended hospital stays, and increased healthcare costs [3].

In Pakistan, the prevalence of pressure ulcers has been reported to be 67%, yet prevention continues to be hindered by inadequate training, inconsistent application of preventive measures, and resource limitations across healthcare institutions [4,5]. Although most professional nurses are theoretically aware of risk factors and prevention guidelines, studies have consistently shown poor translation of knowledge into practice [5,6,7]. A study from Lahore reported that although more than two-thirds of nurses possessed average knowledge, only a small proportion effectively applied evidence-based techniques in clinical practice [8]. Among validated instruments, the Braden scale is the most widely used risk assessment tool for predicting PU development and guiding preventive strategies, and its utilization is considered essential for the early identification of at-risk patients [9].

Newly graduated nurses, despite completing their formal education and clinical internship, often encounter difficulties in confidently applying PU prevention protocols. Their ability to perform evidence-based care is influenced by factors such as limited access to updated clinical guidelines, lack of mentoring, perceived institutional barriers, and inconsistent exposure to evidence-based practices during training [10,11,12]. Unlike prelicensure students, these graduates are expected to function more independently, making their preparedness critical for patient safety outcomes.

Globally, there has been a noticeable shift in research from surface-level knowledge–attitude–practice (KAP) models to predictive frameworks that explore the psychological and contextual drivers of behavior, such as motivation, risk perception, social norms, and institutional influences, thereby providing deeper explanatory and predictive insights into why individuals adopt or resist certain practices. The theory of planned behavior (TPB), which incorporates constructs such as behavioral intention, perceived control, and self-efficacy, has been increasingly used to explain nursing actions in clinical settings [13,14,15]. Such models can more accurately identify gaps in practice and support tailored interventions.

In the local context, training programs such as the Punjab Institute of Cardiology's nursing skill workshops and periodic in-service training sessions conducted in tertiary hospitals, etc., have been shown to temporarily improve PU knowledge; however, barriers such as time constraints, workload, and inadequate institutional support still prevent consistent practices [16,17,18]. There is a need to move beyond assessing knowledge alone and to investigate behavioral, environmental, and institutional predictors that influence actual clinical behavior to design more effective and sustainable interventions.

Despite global evidence and national recognition of the issue, research in Pakistan remains limited with respect to early-career nurses, who have recently transitioned into practice. Existing studies are largely descriptive and do not use multivariate analyses to determine independent predictors of evidence-based behavior [19,20]. This highlights a gap in the understanding of not only the extent of knowledge and attitudes but also the behavioral and institutional factors influencing preventive practices among this group. Given the implications of PUs for both patient outcomes and healthcare quality indicators, addressing this gap is timely and essential. The primary objective of this study was to identify the predictors of evidence-based PU prevention behaviors among recently graduated nurses working in tertiary care hospitals. Specifically, it aims to assess their level of knowledge, attitudes, and self-efficacy, as well as the impact of clinical exposure, internship training, and perceived barriers to their preventive practices.

2. Methods

2.1. Study design and duration

This study employed an exploratory design to examine the determinants of evidence-based PU prevention behaviors. Data collection was conducted over a period of three months, from January to March 2023.

2.2. Ethics approval

Ethical approval was obtained from the Technical & Ethical Review Committee (TERC), Institutional Review and Research Advisory Board (IRRAB) of the Sheikh Zayed Medical Complex, Lahore (No. TERC/SC/Internal/2023/515). Ethical procedures were implemented in accordance with institutional research ethics approval, the National Bioethics Committee (NBC) Pakistan guidelines, and the Declaration of Helsinki. The participants were informed of the voluntary nature of the study, and informed written consent was obtained. Confidentiality and anonymity were maintained throughout data collection, storage, and reporting.

2.3. Sample size and sampling technique

The required sample size was calculated via G*Power 3.1 for a multiple linear regression model. Assuming a medium effect size ($f^2 = 0.15$), a significance level of $\alpha = 0.05$, power = 0.80, and 10 predictors, a minimum sample size of 118 was required [21]. To compensate for a 15% nonresponse rate, the final sample was adjusted to 135 participants.

The formula used was as follows:

$N = [(8/f^2) + m + 1]$, where $f^2 = 0.15$ and $m = 10$.

A purposive sampling technique was used to recruit participants who met the inclusion criteria.

2.4. Study setting and population

The study was conducted at three tertiary care public hospitals in Lahore: Sheikh Zayed Hospital, Jinnah Hospital, and Services Hospital. The target population consisted of nursing graduates who had completed their Bachelor of Science in Nursing (BSN) and had successfully finished their one-year internship in accordance with the Pakistan Nursing & Midwifery Council (PNMC) guidelines within the past six months. These individuals had already been exposed to clinical care environments across multiple specialty units and had met all requirements for eligibility to sit the national licensing examination. This group was selected because of their recent and standardized exposure to patient care, PU management, and evidence-based nursing practices, thus ensuring reliable insights into postacademic behaviors.

2.5. Inclusion and exclusion criteria

The participants eligible for inclusion were male and female nursing graduates who had completed a Bachelor of Science in Nursing (BSN) degree and a one-year clinical internship at a PNMC-accredited institution within the last six months. Only those who had undergone formal rotations across key departments, such as medical, surgical, and critical care units, were considered. Informed consent and voluntary participation were prerequisites for inclusion. Individuals were excluded if they did not meet the recency requirement for internship completion or lacked comprehensive clinical exposure during their internship. Those who could not be contacted or declined participation during data

collection were also excluded. Finally, incomplete or improperly completed questionnaires were excluded from the final dataset.

2.6. Data collection tool and procedure

A structured, self-administered questionnaire consisting of 41 items was used to collect data from the participants. The instrument was developed via validated tools such as the Pressure Ulcer Knowledge Assessment Tool 2.0 (PUKAT 2.0) [22], the Attitude Toward Pressure Ulcer Prevention (APuP) scale [23], and constructs from the Theory of Planned Behavior (TPB) [24]. To ensure cultural and contextual relevance, the items were adapted for the Pakistani healthcare system and the early-career nursing workforce. Content validity was established through expert review, and internal consistency was assessed using Cronbach's alpha, which was calculated for all variables in this study.

Demographic and professional characteristics (9 items) captured respondents' age, gender, marital status, time since internship completion, monthly household income, clinical rotation exposure, attendance at a PU prevention workshop, hours of weekly patient care, and prior training or management experience related to PUs.

Knowledge of PU prevention (4 items) was used to evaluate the understanding of high-risk anatomical sites, the Braden scale components (sensory perception, moisture, activity, mobility, nutrition, and friction/shear), and basic clinical facts such as the effects of malnutrition and the optimal repositioning interval for at-risk patients.

Attitudes and perceived norms (5 items) were used to assess participants' agreement with the significance of PU prevention, its role in enhancing patient safety, peer and instructor influence, and confidence in the use of PU risk assessment tools.

Preventive practices and clinical behavior (8 items) were used to assess behaviors such as patient repositioning, documentation of skin status, use of risk assessment tools and moisture barriers, and patient education on mobility and skin health.

The multidisciplinary practice extension (3 items) further measured routine behaviors such as monitoring nutrition, using pressure-relieving devices, and interprofessional collaboration in prevention strategies.

A single clinical decision-making scenario (1 item) asked participants to choose the most appropriate response for managing an immobile elderly patient with a red, nonblanchable sacral lesion.

The perceived barriers (6 items) addressed systemic and operational obstacles, including insufficient training, lack of equipment, workload pressure, and limited interdisciplinary support.

Self-efficacy (5 items) focused on confidence in executing evidence-based PU prevention tasks, such as risk assessment, staging, independent care planning, patient education, and future preparedness.

The tool included multiple-choice, true/false, and 5-point Likert scale formats (ranging from "Strongly Disagree" to "Strongly Agree" and "Never" to "Always") tailored to each domain. The questionnaire underwent expert review by three senior nurses for content validity. A pilot test with 10 graduate nurses confirmed clarity and feasibility; these responses were excluded from the final analysis.

2.7. Study measures

The primary dependent variable, evidence-based PU prevention behavior, was computed as a composite of two domains: preventive practices and clinical behavior and multidisciplinary and clinical behavior. These two subscales were combined to reflect the breadth of clinical and collaborative PU prevention efforts, with higher scores indicating stronger adherence to recommended practices.

For interpretation, all the constructs were positively scored except for two specific cases. Perceived barriers, although positively scaled, reflect greater hindrance to prevention practices when scores are higher. Moreover, the clinical decision-making score was derived from a single case-based item and was scored as 1 for a correct response and 0 otherwise, with lower medians indicating limited clinical accuracy among participants.

2.8. Data analysis

All the data were analyzed via SPSS (version 27.00). Descriptive statistics, including means, standard deviations, medians interquartile ranges and frequencies, were used to summarize the demographic variables and core constructs related to PU prevention. The internal consistency of the multi-item scales was assessed via Cronbach's alpha. Bivariate correlations (Spearman's rho) were conducted to examine relationships between key independent variables and the composite dependent variable of evidence-based PU prevention behavior. Finally, multiple linear regression analysis was performed to identify significant predictors of evidence-based PU prevention behavior after confirming that assumptions of linearity, independence of errors, normality of residuals, homoscedasticity, and absence of multicollinearity were met; the latter was assessed via tolerance and variance inflation factor (VIF) values. Statistical significance was set at $p < 0.05$ for all analyses.

3. Results

Table 1 shows that most respondents were unmarried (77.33%) or female (87.41%), with a mean age of 25.19 ± 1.62 years. The majority had completed their internship within the last four months (39.26%) and reported an average of 45.59 ± 4.90 hours of patient care per week. Over half (56.30%) had received training on the Braden scale or a similar risk assessment tool, and a majority (84.44%) had managed patients with PUs. However, only 10.37% had attended a formal PU prevention workshop in the past year.

Table 1. Demographic and professional characteristics of the nurses (N = 135).

Variables		Frequency (%)	Mean ± S.D.
Age (in years)		-	25.185 ± 1.617
Gender	Male	17 (12.59)	-
	Female	118 (87.41)	-
Marital status	Single	99 (77.33)	-
	Married	34 (25.19)	-
	Other	2 (1.48)	-
Number of hours in patient care per week		-	45.585 ± 4.898
Time since internship completion	0–2 months	44 (32.59)	-
	3–4 months	53 (39.26)	-
	5–6 months	38 (28.14)	-
Monthly household income (in PKR)	< 30,000	31 (22.96)	-
	30,000 – 50,000	76 (56.30)	-
	>50,000	28 (20.74)	-
Training on the Braden Scale or similar PU risk tools	Yes	76 (56.30)	-
	No	59 (43.70)	-
Assessed or managed a patient with a pressure ulcer	Yes	114 (84.44)	-
	No	21 (15.56)	-
Attended PU preventive workshop in last 12 months	Yes	14 (10.37)	-
	No	121 (89.63)	-

The internal consistency for all the multi-item scales was strong, with Cronbach's alpha values ranging from 0.817-0.898. Table 2 presents descriptive statistics and internal consistency values for key constructs related to PU prevention. Nurses demonstrated a median knowledge score of 3.00 (IQR = 2.00) and reported generally positive attitudes (median = 5.80, IQR = 1.20) and self-efficacy (median = 5.40, IQR = 1.40) regarding PU prevention. Reported adherence to preventive practices (median = 4.25, IQR = 1.37) and multidisciplinary behaviors (median = 3.67, IQR = 1.33) was observed. Notably, the median score for perceived barriers (median = 5.17, IQR = 2.17) indicated that the participants reported considerable challenges with implementation. In addition, the clinical decision-making score was low (mean = 0.04 ± 0.21), suggesting limited accuracy in recognizing and responding to PU risk scenarios.

Table 2. Descriptive statistics and internal consistency of constructs related to pressure ulcer prevention among nurses.

Construct	Median (IQR)	Cronbach Value
Knowledge of pressure ulcer prevention	3.00 (2.00)	-
Attitudes toward pressure ulcer prevention	5.80 (1.20)	0.878
Self-efficacy	5.40 (1.40)	0.846
Preventive practices and clinical behavior	4.25 (1.37)	0.897
Multidisciplinary and clinical behavior	3.67 (1.33)	0.817
Perceived barriers	5.17 (2.17)	0.898

All the constructs are scored positively, where higher scores reflect a stronger presence or frequency of the measured variable. However, for perceived barriers, higher scores indicate a greater number of obstacles perceived by nurses that may impede pressure ulcer prevention.

Table 3 shows the bivariate correlations between attitudes, self-efficacy, perceived barriers, and knowledge of pressure ulcer prevention and evidence-based PU prevention behavior. Among the predictors, only knowledge of PU prevention showed a statistically significant positive correlation ($\rho = 0.266$, $p = 0.002$), indicating that greater knowledge was associated with better preventive behavior. Other variables—attitudes, self-efficacy, and perceived barriers—were not significantly correlated with the outcome.

Table 3. Bivariate correlations between predictors and evidence-based PU prevention behavior.

Independent Variables	Median (IQR)	Cronbach Value
Attitudes	-0.043	0.624
Self-efficacy	0.057	0.509
Perceived barriers	0.182	0.182
Knowledge of pressure ulcer prevention	0.266	0.002 **

* Spearman correlation (2-tailed). ** $p < 0.01$ was considered statistically significant. *** The dependent variable, evidence-based pressure ulcer prevention behavior, is a composite of preventive practices and clinical behavior and multidisciplinary and clinical behavior. **** Higher scores on perceived barriers indicate more obstacles to PU prevention.

Table 4 presents the results of a regression analysis identifying predictors of evidence-based PU prevention behavior. Among all the predictors, only knowledge of PU prevention emerged as a statistically significant predictor (B = 0.256, $p = 0.003$), indicating that increased knowledge was associated with better preventive practices. Other variables—including self-efficacy, attitudes and perceived norms, perceived barriers, and the clinical decision-making score—did not significantly contribute to the model. No issues of multicollinearity were detected, as indicated by acceptable tolerance and VIF values.

Table 4. Predictors of evidence-based pressure ulcer prevention behavior.

Predictor Variable	B	t	*p Value*	Tolerance	VIF
Self-efficacy	0.054	1.020	0.310	0.946	1.057
Attitudes and perceived Norms	-0.053	-0.989	0.325	0.940	1.063
Perceived barriers	0.070	1.465	0.145	0.980	1.020
Clinical decision-making score	0.450	1.420	0.158	0.954	1.048
Knowledge of pressure ulcer prevention	0.256	3.052	0.003 ***	0.976	1.025

* Linear regression analysis was conducted to examine the predictors of evidence-based PU prevention behavior. ** The dependent variable is a composite of preventive practices and clinical behavior and multidisciplinary and clinical behavior. *** Statistical significance was evaluated at $p < 0.05$. **** Model summary: $R = 0.328$, $R^2 = 0.108$, adjusted $R^2 = 0.073$, standard error = 0.74120, Durbin–Watson = 1.397.

4. Discussion

This study aimed to examine the predictors of evidence-based PU prevention behavior among recently graduated nurses in tertiary care hospitals. The findings highlight that while nurses demonstrated moderately positive attitudes, self-efficacy, and preventive behaviors, only knowledge of PU prevention significantly predicted their engagement in evidence-based practices. Other psychological and contextual factors, such as attitudes, perceived barriers, and clinical decision-making, showed no meaningful associations with practice behaviors. Despite high levels of reported exposure to PU cases, limited participation in structured prevention workshops and low decision-making accuracy suggest a gap between theoretical understanding and practical application.

The central role of knowledge in influencing PU prevention behavior supports prior international evidence emphasizing that clinical competence begins with a strong factual foundation. For example, studies conducted in Saudi Arabia and Europe revealed that nurses with greater PU-related knowledge were more likely to engage in regular repositioning, risk assessment, and the use of pressure-relieving devices [25,26]. Similarly, a study from Saudi Arabia identified inadequate PU knowledge as a key contributor to poor preventive adherence among nursing interns [27]. Our findings align with this pattern, suggesting that enhancing factual knowledge may be the most direct and feasible intervention to improve PU prevention behaviors among early-career nurses in Pakistan. A study from Pakistan demonstrated an inadequate level of knowledge among nurses for the assessment, classification and prevention of PUs [28]. However, another study highlighted better knowledge among nurses for PU prevention and management but mentioned a lack of human and material resources to hinder optimal healthcare delivery [29].

In this study, attitudes and perceived norms were not significantly associated with PU prevention behavior. This differs from findings in Western healthcare settings, where several studies have reported that nurses' positive attitudes and peer influence significantly predict adherence to PU prevention practices under the Theory of Planned Behavior [30,31]. The difference may be due to the transitional professional identity and role ambiguity faced by newly graduated nurses in the local healthcare system. In cultures where hierarchical and protocol-driven clinical environments are dominant, personal attitudes may be overpowered by institutional or supervisory mandates, limiting their impact on behavior.

The nonsignificant effect of perceived barriers is noteworthy, given that prior qualitative studies in LMIC settings frequently cite resource constraints, workload pressures, and lack of support as key deterrents to preventive practice [32]. It is possible that the early-career nurses in our sample either internalized these challenges as systemic norms or lacked the authority to influence change, thus decoupling perceived barriers from their reported behaviors.

Interestingly, clinical decision-making accuracy—assessed through a case-based scenario—was also not a significant predictor, even though most nurses reported high exposure to PU cases. This could indicate limitations in applying clinical reasoning and critical thinking skills to PU management, as evidenced by the low average decision-making score. Similar issues have been reported in studies, where clinical experience alone did not translate to effective bedside decisions owing to inadequate training in case-based judgment [33,34]. A study from Pakistan highlighted that the compatibility of nurses with PU management varied with level of experience, gender and working area speciality [35]. However, educational and interventional programs have proven to be effective in PU prevention and management [36].

A major strength of this study is its focus on recently graduated nurses—a critical yet often overlooked group in the PU prevention literature—offering insights into their preparedness and educational gaps. The use of composite behavioral outcomes and validated constructs grounded in behavioral theory adds conceptual strength. However, the study's design restricts causal inference, and reliance on self-reported behaviors introduces potential bias. The limited geographical scope (public tertiary hospitals in Lahore) and the use of a single-item clinical scenario to assess decision-making also constrain generalizability and depth. In addition, the study population was restricted to newly enrolled RNs with up to six months of postinternship experience, which may limit their ability to demonstrate the same confidence in applying knowledge as more experienced nurses do. Although PU prevention is included in the BSN curriculum (e.g., in pathophysiology and health assessment courses), the educational gap identified here is related to limited reinforcement through structured clinical training, simulation, and case-based practice, which are critical for translating theoretical knowledge into confident bedside applications. Future studies should explore longitudinal behavior changes and assess intervention effects through more objective clinical measures.

5. Conclusions

The study concluded that among recently graduated nurses, knowledge of PU prevention was the only significant predictor of evidence-based preventive behaviors. Attitudes, self-efficacy, perceived barriers, and clinical decision-making did not show meaningful associations with practice, highlighting a gap between theoretical preparation and practical application. These findings suggest that while early-career nurses may possess baseline awareness and positive orientations toward PU prevention, strengthening their applied knowledge through structured training remains critical. Future research should examine how knowledge and behavior evolve with clinical experience and assess the impact of targeted educational interventions.

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References

[1] Shiferaw WS, Akalu TY, Mulugeta H, Aynalem YA. The global burden of pressure ulcers among patients with spinal cord injury: a systematic review and meta-analysis. BMC Musculoskelet Disord. 2020;21:334. https://doi.org/10.1186/s12891-020-03369-0

[2] Borojeny LA, Albatineh AN, Dehkordi AH, Gheshlagh RG. The incidence of pressure ulcers and its associations in different wards of the hospital: a systematic review and meta-analysis. Int J Prev Med. 2020;11(1):171. https://doi.org/10.4103/ijpvm.ijpvm_182_19

[3] Roussou E, Fasoi G, Stavropoulou A, Kelesi M, Vasilopoulos G, Gerogianni G, et al. Quality of life of patients with pressure ulcers: a systematic review. Med Pharm Rep. 2023;96(2):123-30. https://doi.org/10.15386/mpr-2531

[4] Jabar M, Riaz HM, Sajjad SA, Rana AA, Ahmad I, Khalid S. Prevalence of pressure ulcers and its relative distribution among hospitalized patients in tertiary care hospitals of Lahore. Ann Med Health Sci Res. 2022;12(S1):77-80. https://doi.org/10.54608.annalsmedical.2022.s1

[5] Tahir MA, Khan MA, Ikram A, Chaudhry TH, Jabeen A, Quddous A, et al. Assessment of Infection Prevention and Control (IPC) implementation and strategies used for IPC preparedness at facility level in underdeveloped areas of Pakistan. Infect Drug Resist. 2023;16:1997-2006. https://doi.org/10.2147/idr.s399830

[6] Hashemiparast M, Negarandeh R, Theofanidis D. Exploring the barriers of utilizing theoretical knowledge in clinical settings: a qualitative study. Int J Nurs Sci. 2019;6(4):399-405. https://doi.org/10.1016/j.ijnss.2019.09.008

[7] Aiman UE, Saddique H, Jabeen R. Nursing knowledge and practice regarding the prevention of pressure ulcer. Biol Clin Sci Res J. 2024;5(1):1150. https://doi.org/10.54112/bcsrj.v2024i1.1150

[8] Nisa MU, Rafiq N, Ali A, Rizwan Z, Ilyas F, Fatima N. Evaluation of knowledge among nurses about pressure ulcer in a tertiary care hospital, Lahore. J Health Rehabil Res. 2024;4(2):543-47. https://doi.org/10.61919/jhrr.v4i2.853

[9] Bergstrom N, Braden BJ, Laguzza A, Holman V. The Braden Scale for predicting pressure sore risk. Nurs Res. 1987;36(4):205-10. https://doi.org/10.1097/00006199-198707000-00002

[10] Ghafoor N, Munir R, Niazi IMK, Azhar F. Knowledge and practices of student nurses towards prevention and management of pressure ulcers in allied hospitals of Rawalpindi Medical University. J Rawalpindi Med Coll. 2021;25(3):323-27. https://doi.org/10.37939/jrmc.v25i3.1413

[11] Al Gharash H, Alharbi A, Alshahrani Y, Mousa O. Knowledge and attitude of nursing interns toward pressure injury prevention in Saudi Arabia: a multiregional cross-sectional study. SAGE Open Nurs. 2024;10:23779608241251631. https://doi.org/10.1177/23779608241251631

[12] Bibi A, Khan S, Ali M. Assessment of intensive care unit nurses' knowledge regarding pressure ulcers in a tertiary care hospital Karachi. J Gandhara Nurs Allied Health Sci. 2023;3(1):35-8. https://doi.org/10.37762/jfinph.99

[13] Ajzen I. The theory of planned behavior. Organ Behav Hum Decis Process. 1991;50(2):179–211. https://doi.org/10.1016/0749-5978(91)90020-T

[14] Alshahrani SH, Qureshi AA, Paulsamy P, Venkatesan K, Sethuraj P. Knowledge and attitude of nursing students on the prevention of pressure ulcers. Int J Curr Res Chem Pharm Sci. 2021;8(8):13-8. http://doi.org/10.22192/ijcrcps.2021.08.08.003

[15] Ursavaş FE, İşeri Ö. Effects of education about prevention of pressure ulcer on knowledge and attitudes of nursing students. J Tissue Viability. 2020;29(4):331-36. https://doi.org/10.1016/j.jtv.2020.06.006

[16] Hassan N, Afzal M, Sehar S, Gilani A. Effect of educational program on pressure ulcer prevention intervention among nurses of intensive care units at a public hospital, Pakistan. Clin Soc Work Health Interv. 2020;11(4):38-45. https://doi.org/10.22359/cswhi_11_4_05

[17] Nahar K, Khatun M, Begum MB, Lily SA, Saha AK. Nurses' knowledge and practice on pressure ulcer prevention and management for hospitalized patients at tertiary level hospital. Int J Med Sci Clin Res Stud. 2021;1(5):113-23. https://doi.org/10.47191/ijmscrs/v1-i5-05

[18] Sham F, Sharif DIB, binti Moksin N, Selamat H. Knowledge, practice and perceived barrier of pressure ulcer prevention among nurses in a public hospital in Selangor. Malaysian J Public Health Med. 2020;20(Special1):325-35. https://doi.org/10.37268/mjphm/vol.20/no.Special1/art.738

[19] Labrague LJ, McEnroe-Pettite D, Tsaras K, D'Souza MS, Fronda DC, Mirafuentes EC, et al. Predictors of evidence-based practice knowledge, skills, and attitudes among nursing students. Nurs Forum. 2019;54(2):238-45. https://doi.org/10.1111/nuf.12323

[20] Mõttus R, Wood D, Condon DM, Back MD, Baumert A, Costantini G, et al. Descriptive, predictive and explanatory personality research: different goals, different approaches, but a shared need to move beyond the Big Few traits. Eur J Personality. 2020;34(6):1175-201. https://doi.org/10.1002/per.2311

[21] Faul F, Erdfelder E, Buchner A, Lang AG. Statistical power analyses using G*Power 3.1: tests for correlation and regression analyses. Behav Res Methods. 2009;41:1149-60. https://doi.org/10.3758/BRM.41.4.1149

[22] Rostamvand M, Abdi K, Gheshlagh RG, Khaki S, Dehvan F, Barzgaran R. Nurses' attitude on pressure injury prevention: a systematic review and meta-analysis based on the pressure ulcer prevention instrument (APuP). J Tissue Viability. 2022;31(2):346-52. https://doi.org/10.1016/j.jtv.2021.12.004
[23] Shanley E, Moore Z, Patton D, O'Connor T, Avsar P, Nugent L, et al. Development and psychometric evaluation of the patient knowledge of, and attitudes and behaviours towards pressure ulcer prevention instrument (KPUP). Int Wound J. 2020;17(2):339-50. https://doi.org/10.1111/iwj.13278
[24] Wang J, Liu W, Zhao Q, Xiao M, Peng D. An application of the theory of planned behavior to predict the intention and practice of nursing staff toward physical restraint use in long-term care facilities: structural equation modeling. Psychol Res Behav Manag. 2021;14:275-87. https://doi.org/10.2147/PRBM.S293759
[25] Samuriwo R, Dowding D. Nurses' pressure ulcer related judgements and decisions in clinical practice: a systematic review. Int J Nurs Stud. 2014;51(12):1667-85. https://doi.org/10.1016/j.ijnurstu.2014.04.009
[26] Sahrah AZ, Althobaiti WA, Albalawi SR, Althobaiti ES, Alfattah TS, Almalki AA, et al. Knowledge and practice regarding pressure injury prevention among nurses at King Abdul-Aziz Specialist Hospital. Evid Based Nurs Res. 2023;5(4):11-23. https://doi.org/10.47104/ebnrojs3.v5i4.292
[27] Tumala RB. Predictors of nursing interns' standard precautions compliance during internship training in four teaching hospitals in Saudi Arabia. Int J Nurs Pract. 2021;27(3):e12897. https://doi.org/10.1111/ijn.12897
[28] Memon AG, Razzaque A, Shah S, Jafferi AA, Haider H, Lashari TN. Knowledge of nursing professionals about pressure ulcer prevention. Rawal Med J. 2021;46(4):910-13.
[29] Ebi WE, Hirko GF, Mijena DA. Nurses' knowledge to pressure ulcer prevention in public hospitals in Wollega: a cross-sectional study design. BMC Nurs. 2019;18:20. https://doi.org/10.1186/s12912-019-0346-y
[30] Manning AC. Evaluating theory-based educational training on knowledge and attitude of registered nurses who care for patients at risk for pressure injury in acute care environments [dissertation]. Wilkes-Barre (PA): Wilkes University, The Passan School of Nursing; 2022.
[31] Lee J, Kang SJ. Factors influencing nurses' intention to care for patients with emerging infectious diseases: application of the theory of planned behavior. Nurs Health Sci. 2020;22(1):82-90. https://doi.org/10.1111/nhs.12652
[32] Institute of Medicine, Board on Health Care Services, Committee on the Work Environment for Nurses and Patient Safety. Work and workspace design to prevent and mitigate errors. In: Page A, editor. Keeping patients safe: transforming the work environment of nurses. Washington (DC): National Academies Press (US); 2004. p. 241–88. https://doi.org/10.17226/10851
[33] Poston KM, Brunette G, Ciccone J. Collaborative strategies to improve clinical judgement and address bedside care challenges. Teach Learn Nurs. 2023;18(3):e94-7. https://doi.org/10.1016/j.teln.2023.02.001
[34] Zhang Y, Xu X, Wang F, Tu L, Deng Q, Xu M, et al. The use of bedside case-based learning in the clinical practice of midwifery education in China. BMC Med Educ. 2024;24:1308. https://doi.org/10.1186/s12909-024-06251-y
[35] Junejo Z, Channar HB, Zakarya M, Talpur MA, Channa S, Aghani S. Analysis of clinical competencies among staff nurses regarding pressure ulcer management. J Asian Dev Stud. 2024;13(2):1745-53. https://doi.org/10.62345/jads.2024.13.2.137
[36] Noor AM, Hassan H. Effectiveness of an interventional program on nurses practices about prevention of pressure ulcer at the intensive care unit. Kufa J Nur Sci. 2021;11(1):59-66. https://doi.org/10.36321/kjns.vi20211.433