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Knowledge and Attitudes toward Pressure Injury Prevention among Nurses in King Salman Armed Forces Hospital, Kingdom of Saudi Arabia

Ibtisam Oudah Al Atawi[1*], Fatmah Salman Al Atawi[1], Hasan Mohammed Salem[1], Amer Nabil Abu Alrub[1], Mona Oudah Al Balwi[1], Fatimah Musallam Al Hawiti[1], Fatmah Ali Khubrani[1], Wejdan Maki Saleh[1], Marwan Abdulmajeed Manajreh[2]

[1]Nursing Department, King Salman Armed Forces Hospital, Tabuk, Saudi Arabia
[2]Research Department, King Salman Armed Forces Hospital, Tabuk, Saudi Arabia
Email: *Highsky1990ia@hotmail.com

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Abstract

Background: Pressure injuries continue to pose a significant challenge to the healthcare system and are considered one of the most common preventable complications of hospitalization, which can increase the risk of infection, lead to an extended hospital stay, and incur costs to both the organization and the patient. Understanding the Knowledge and attitudes of nurses towards pressure injury prevention is crucial for developing effective strategies to mitigate this issue. **Objective:** To assess the level of Knowledge and attitude of nurses towards Pressure injury prevention in King Salman Hospital, Saudi Arabia. We also evaluated the correlation between nurses' Knowledge and attitude and identified the associations between personal characteristics of nurses and their knowledge and attitude. **Methods:** This cross-sectional study was conducted at King Salman Hospital, Tabuk City, Saudi Arabia, over 9 months. The study population consists of Nurses working in King Salman Armed Forces Hospital, Tabuk. A total of 393 nurses were included in the study. An assessment of Knowledge and attitude was conducted using two validated questionnaires: the Pressure Injury Knowledge Assessment Tool and the Second Questionnaire, which measures nurses' attitudes specifically through the APUP instrument. Both tools have their own standard scoring criteria for assessing Knowledge and attitude. Data entry and analysis were performed using SPSS version 25. **Results:** The total score reflects an overall moderate knowledge level of 48.32%, indicating room for improvement across all domains, with an overall attitude score of 68.68%. The study revealed that a positive attitude (Attitude

score >75%) was observed in only 49 (12.4%) of the nurses. Age, Gender, Educational status, and working experience showed no significant impact on the knowledge and attitude score. Knowledge and attitude score showed a p-value (0.141), indicating a very weak, non-significant positive relationship. The result implies that higher knowledge levels are correlated with more positive attitudes toward pressure injury prevention. **Conclusion:** The results of this study demonstrate that nurses with low knowledge and attitude scores were unsatisfactory regarding pressure injury prevention. There is a pressing need to enhance both Knowledge and attitudes among nurses regarding the prevention of pressure injuries. The development of education and training programs, including workshops, lectures, and presentations, is necessary to improve the Knowledge of nursing staff toward the prevention of pressure injuries.

Keywords

PUKAT, Pressure Injury, Knowledge, Attitude, Nurses, Tabuk, Saudi Arabia

1. Introduction

Pressure injuries are linked to detrimental effects on patients and healthcare systems, including an elevated risk of nosocomial infections, pain and disability, extended hospital stays, morbidity and mortality, and high expenses for healthcare facilities. Hospital-acquired pressure Injury (HAPI) has been a significant concern among hospitalized patients. According to the most recent worldwide evidence synthesis, the hospital-acquired rate and PI prevalence among adult patients were 8.4% and 12.8%, respectively [1]. Although pressure injuries have garnered more public attention over the last 20 years, their frequency has remained essentially unchanged, and related medical expenses continue to increase. Approximately 3 million people in the US are affected by pressure injuries each year. The frequency among hospitalized patients ranges from 5% to 15%, with certain long-term care facilities and critical care units having a much higher proportion [2]. There is a dearth of published data on the Prevalence of pressure injury in Saudi Arabia. In 2024, King Saud Medical City in Riyadh conducted a descriptive cross-sectional study. Over the course of the trial, 250 patients with pressure ulcers were found. The Prevalence of pressure injuries in the hospital units that were part of the study was 18.8% [3]. Another study conducted at King Abdulaziz Medical City in Jeddah in 2016 demonstrated the Prevalence and incidence of hospital-acquired pressure injuries among 370 admitted patients who were tested for PI. The respective rates were 5.7% and 1.6 ulcers per 1000 patient days [4]. A prospective cohort study was conducted in two adult intensive care units (ICUs) in Saudi Arabia. A total of 84 patients were screened for pressure injuries, and 33 participants were found to have new Pressure injuries, giving a cumulative hospital-acquired Pressure injury incidence of 39.3% (33/84 patients). The incidence of medical device-

related PUs was 8.3% (7/84). Compared to other worldwide research, the Pressure injury incidence rate was higher [5].

Because maintaining skin integrity is essentially the responsibility of nursing practice and because hospital-acquired pressure injuries may be classified as "nursing injuries" under medico-legal law, the occurrence of pressure injuries in healthcare settings is seen to be a sign of the quality of nursing care [6].

A Pressure injury is defined according to NPIAP (2020) as "localized damage to the skin and underlying soft tissue usually over a bony prominence or related to a medical or other device [7]. The injury can present as intact skin or an open ulcer and may be painful. The injury occurs because of intense and/or prolonged pressure or pressure in combination with shear. The tolerance of soft tissue for pressure and shear may also be affected by microclimate, nutrition, perfusion, comorbidities, and the condition of the soft tissue. The tolerance of soft tissue for pressure and shear may also be affected by microclimate, nutrition, perfusion, comorbidities, and condition of the soft tissue." Prolonged external pressure, shearing force, and prolonged contact with hard surfaces create tissue compression in the bone prominence region, which is the primary cause of pressure injuries. Impaired lymphatic drainage, caused by tissue compression, leads to tissue ischemia at pressure sites, resulting in increased interstitial fluid and the accumulation of debris [8]. PI stages include Deep Tissue PI, Unstageable PI, Stage 1 PI, Stage 2 PI, Stage 3 PI, and Stage 4 PI, among other PI classifications. Mucosal membrane PI and PI associated with medical devices [7]. The sacrum is where pressure injuries occur most often. Additional typical locations are the back of the head, ears, shoulders, elbows, inner knees, heels, greater trochanter, ischial tuberosity, or malleoli [9].

Approximately 95% of all pressure injuries (PIs) are preventable, making the prevention of pressure ulcers essential. Nurses in daily contact with patients at high risk for pressure ulcers should have an adequate knowledge level and a positive attitude. It is the duty of nurses to prevent pressure injuries in patients who are at risk; however, it is often observed that they do not follow the recommendations for preventing pressure injuries, which may be due to a lack of awareness or education. Regular training in PI prevention is necessary for nurses, as a lack of Knowledge and skills in this area may increase the risk of acquiring PIs. Nurses who are knowledgeable about PI prevention are better able to determine which patients should receive prevention and how to apply it [10].

The most often mentioned obstacles to PI prevention are thought to be ignorance and a negative attitude toward PI prevention. By facilitating the use of preventive care measures with deliberate decision-making, nurses' adequate understanding of PIs contributes significantly to the improvement of nursing care quality and the reduction of incidence and prevalence rates [11]. Although nurses play a significant role in managing pressure injuries, the majority of research conducted worldwide demonstrate that their Knowledge, attitudes, and behaviors about their prevention are not at the required level [11]. Understanding and iden-

tifying nurses' attitudes towards pressure injury prevention strategies can reveal their beliefs and behaviors about pressure injury prevention and risk assessment, which may affect pressure injury preventive practices [12]. The objective of this study is to assess the level of Knowledge and attitude of nurses towards pressure injury prevention in King Salman Hospital, Saudi Arabia. We also evaluated the correlation between nurses' Knowledge and attitude and identified the associations between personal characteristics of nurses and their knowledge and attitude.

2. Methods

A cross-sectional study was conducted at King Salman Hospital in Tabuk, Saudi Arabia, over nine months. The study population consists of nurses working at King Salman Armed Forces Hospital in Tabuk. The inclusion criteria for this study were General Nurses providing direct care to patients and consenting to participate in the study. Exclusion criteria: Nurses who were not working in clinical areas (administrative department) and Nurses who do not handle patients at risk for pressure injuries were excluded from the study. A total of 393 nurses were included in the survey, working in various hospital departments, selected using a simple random sampling technique. Data collection was conducted using a prevalidated questionnaire to assess the Knowledge and attitudes of nurses. The goal, methodology, adherence to confidentiality, and anonymity within the study were all explained to the study population. The questionnaire was distributed in an electronic format on Google Forms. It took about 20 minutes to complete. The questionnaire was administered in English, which is the official language of the hospital and is understandable by nurses of all nationalities. The first Version of the Pressure Ulcer Knowledge Assessment Tool 2.0 was validated and is reliable in assessing Knowledge of pressure ulcer prevention, consisting of 25 multiple-choice items. It is considered that obtaining a score of more than 60% indicates appropriate Knowledge [14]. It covers six themes most relevant to pressure ulcer prevention Includes: 1) etiology and development, 2) classification and observation, 3) nutrition, 4) risk assessment, 5) prevention of pressure ulcers 6) specific patient groups focuses on the unique considerations and preventive measures required for particular populations that are at an increased risk of developing pressure ulcers. These groups may include individuals with specific medical conditions, mobility limitations, or other factors that necessitate tailored prevention strategies. We discuss preventive measures with minimal handling for people with hemodynamic instability. The Second Questionnaire to measure nurse's attitudes APUP instrument was develop by Beeckman contains a short multiple-choice questionnaire consisting of five factors: personal competence to prevent PU (3 items), priority of PU prevention (3 items), impact of PU (3 items), responsibility for PU prevention (2 items), and Confidence in the effectiveness of prevention (2 items) [13]. According to study carried out by Beeckman a mean attitude score of more than 75% of the maximum score was considered good in this investigation [14].

A pre-test was conducted for both questionnaires before data collection. Ethical approval was obtained from the institutional ethics review board committee before commencing the study. Data collection was conducted using the English version of the questionnaire. The nurses were briefed on the questionnaire, its purpose, and instructions on how to complete it, including the scoring criteria for both questionnaires, to facilitate better understanding and ease of filling out the questionnaire. After data collection, the questionnaire was screened for any missing data. Quantitative variables were presented as mean ± SD, and qualitative variables were presented as frequency and percentage. Correlation was assessed between the knowledge and attitude scores. Both knowledge and attitude scores were compared with personal characteristics of nurses to see how both scores relate to age, gender, education, working experience, and additional training on pressure injuries. Independent sample t-tests and one-way ANOVAs were used to compare both scores in relation to nurses' personal characteristics. P-value ≤ 0.05 was considered statistically significant.

3. Results

Table 1. The Level of nursing knowledge about pressure injury prevention.

		%	Mean ± SD	Max Score
PUKAT	Etiology	**46.5%**	2.79 ± 1.29	6
	Classification and observation	**55.8%**	2.23 ± 1.10	4
	Risk assessment	**33.6%**	0.67 ± 0.66	2
	Nutrition	**54.4%**	1.63 ± 0.93	3
	Prevention Of Pressure injury	**48.0%**	3.36 ± 1.44	8
	Specific-Patient Groups	**69.7%**	1.39 ± 0.73	2
	Total Score	**48.3%**	12.08 ± 3.65	25

Table 1 presents the level of nursing knowledge about pressure injury prevention before t, using the Pressure Ulcer Knowledge Assessment Tool (PUKAT). The mean scores for specific domains highlight varying levels of knowledge. The highest percentage scores are seen in the "Specific Patient Groups" domain (69.72%), followed by "Classification and Observation" (55.78%) and "Nutrition" (54.36%). The lowest knowledge scores are in the "Risk Assessment" domain (33.58%). The total score reflects an overall moderate knowledge level of 48.32%, indicating room for improvement across all domains.

Table 2 presents the attitude domains are scored on personal competence, priority of prevention, impact, responsibility, and confidence in effectiveness. The scores range from 66.60 (Impact) to 71.27 (Confidence in Effectiveness), with an overall attitude score of 68.68. Higher scores indicate a more positive attitude. In this study only 49 (12.4%) nurses had scored ≥75% and the remaining 344 (87.6%) nurses had scored <75% score on attitude scale (Figure 1).

Table 2. Nursing attitude towards pressure injury.

	%	Mean ± SD	Max Score
Personal competence for prevention	**69%**	8.2 ± 1.2	12
Priority of prevention	**70%**	8.3 ± 1.1	12
Impact	**67%**	8.0 ± 1.3	12
Responsibility	**68%**	5.4 ± 1.0	8
Confidence in the effectiveness of prevention	**71%**	5.7 ± 1.1	8
Total Score	**69%**	35.7 ± 3.3	52

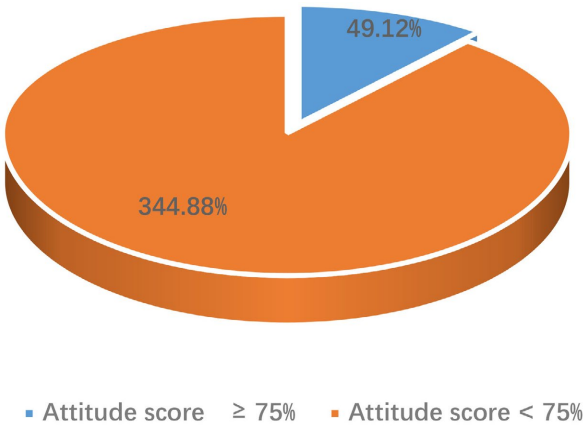


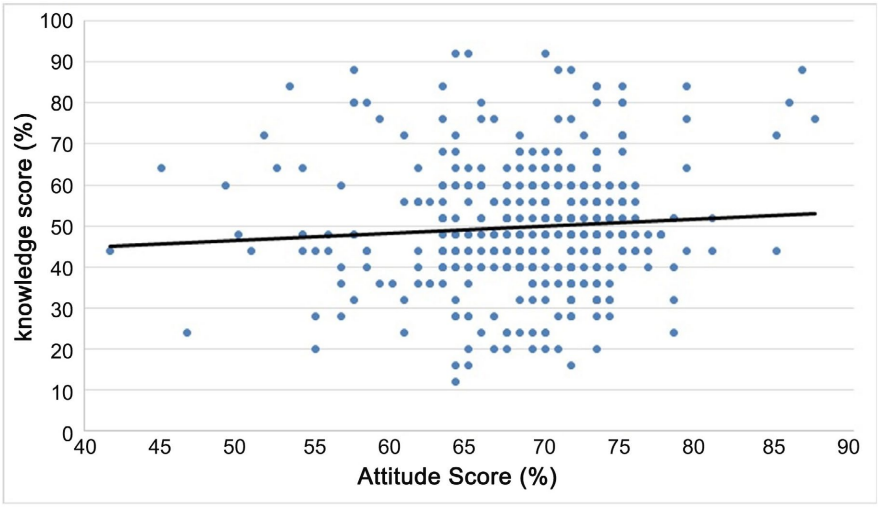
Figure 1. Satisfactory attitude score.

Table 3. Total score for knowledge about pressure injury prevention in relation to study participant's characteristics.

		n	Knowledge Score		p-value	Attitude Score		p-value
			Mean	SD		Mean	SD	
Age	**<25**	27	52.74	13.45	**0.246(A)**	69.20	4.72	**0.893(A)**
	26 - 30	64	50.81	15.53		68.95	6.98	
	31 - 40	214	48.36	15.55		68.52	6.64	
	41 - 50	88	51.32	13.99		69.01	5.42	
Gender	**Male**	24	49.67	15.10	**0.986(t)**	68.23	6.41	**0.679(t)**
	Female	369	49.72	15.12		68.78	6.31	
Education	**Diploma**	134	50.45	14.98	**0.775(A)**	68.90	4.48	**0.852(A)**
	Bachelors	249	49.38	15.37		68.62	7.13	
	Master	10	48.40	9.51		69.50	5.87	
Experience	**<2 Years**	37	49.84	11.98	**0.556(A)**	67.97	5.89	**0.206(A)**
	2 - 5 Years	67	48.12	12.00		68.83	5.19	
	6 - 10 Years	131	48.95	16.25		68.01	7.33	
	11 - 20 Years	134	50.57	16.71		69.75	5.49	
	>20 Years	24	53.50	10.54		68.09	7.57	

Note: **(t)** Independent sample t-test, **(A)** One Way ANOVA.

Table 3 presents the knowledge and attitude scores concerning participant characteristics. Across all categories (age, gender, education, and experience), the differences in knowledge and attitude scores are minimal, with no statistically significant variations (p-value > 0.05).



r = 0.074, p-value = 0.141.

Figure 2. Correlation between knowledge & attitude score.

Figure 2 explores the correlation between knowledge and attitude scores. The correlation coefficient (r = 0.074) and p-value (0.141) indicate a very weak, non-significant positive relationship. This implies that higher knowledge levels correlate more positive attitudes toward pressure injury prevention up to some extent.

To explore any further connection between the attitude score level among different demographic and knowledge scores, we categorized the attitude level in Satisfactory and satisfactory levels with a cut off score of 75%.

Table 4. Attitude satisfactions score levels in relation to study participant's characteristics and their knowledge scores.

		Attitude Score		Chi-Square	p-value
		≥75%	<75%		
Gender	**Male**	4	20	0.413	0.521
	Female	45	324		
Age	**<25**	2	25	3.373	0.334
	26 - 30	12	52		
	31 - 40	26	188		
	41 - 50	9	79		
Education	**Diploma**	8	126	8.191	**0.018**
	Bachelors	40	209		
	Masters	1	9		

Continued

Experience	**<2**	2	35	3.079	0.550
	2 - 5	7	60		
	6 - 10	16	115		
	11 - 20	20	114		
	>20	4	20		
		Mean ± SD		**T-Test**	**p-value**
Knowledge Score (%)		56.01 ± 14.8	48.81 ± 14.9	3.189	**0.002**

Table 4 showed a significant association between the educational background of the participants in their attitude score levels (p = 0.018). Bachelor degree showed a more satisfactory attitude than others. No significant difference in attitude scores was reported in different gender, age and work experience of the participants. However, findings of student t-test reported a significant mean difference in knowledge scores among the categories of satisfactory attitude scores. Participants those were categorized as satisfied (attitude score ≥75%) were having significantly better knowledge scores as well. (p = 0.002).

Table 5. Domain wise score for Knowledge about pressure injury prevention in relation to study participant's characteristics.

	n	%	Etiology		Classification		Risk assessment		Nutrition		Prevention		Specific Patient group	
Age														
			Mean	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**
<25	27	6.85%	50.62	16.97	50.93	26.39	42.59	33.12	62.96	29.72	51.32	21.43	68.52	39.58
26 - 30	64	16.2%	47.92	20.03	53.91	27.90	32.03	32.57	54.69	32.73	46.87	22.97	71.09	36.52
31 - 40	214	54.8%	44.94	22.41	56.43	28.09	31.07	33.63	53.27	31.93	46.73	20.45	67.99	36.14
41 - 50	88	22.2%	48.11	21.51	57.10	27.32	38.07	33.04	54.17	29.17	50.97	18.98	73.30	37.87
p-value[a]			**0.411**		**0.699**		**0.179**		**0.512**		**0.318**		**0.701**	
Gender														
Male	24	6.1%	45.83	22.66	67.71	29.93	43.75	42.51	54.17	30.79	44.64	18.99	66.67	35.10
Female	369	93.9%	46.57	21.46	55.01	27.43	32.93	32.66	54.38	31.37	48.24	20.75	69.92	36.90
p-value[b]			**0.872**		**0.030**		**0.232**		**0.974**		**0.409**		**0.675**	
Education														
Diploma	134	34.1%	47.14	21.87	55.41	27.65	36.57	34.77	57.21	31.82	50.75	21.42	74.25	35.08
Bachelors	249	63.4%	46.52	21.36	55.82	28.06	31.53	32.07	52.74	31.01	46.30	20.19	68.07	37.23
Master	10	2.5%	38.33	20.86	60.00	21.08	45.00	43.78	56.67	31.62	54.29	17.56	50.00	40.82
p-value[a]			**0.460**		**0.880**		**0.204**		**0.401**		**0.082**		**0.066**	

Continued

Experience (Years)														
<2	37	9.3%	50.45	15.46	52.70	24.14	32.43	31.66	63.06	26.97	45.17	19.20	66.22	39.18
2 - 5	67	16.9%	46.02	19.70	55.22	28.05	29.85	31.45	54.73	33.69	48.19	20.02	72.39	35.12
6 - 10	131	33.3%	44.91	21.87	55.53	27.61	31.68	32.35	50.89	31.31	46.13	21.60	70.23	34.96
11 - 20	134	34.3%	46.89	23.32	56.90	28.82	37.69	35.45	55.22	32.21	50.32	20.93	68.28	38.56
>20	24	6.1%	48.61	22.48	57.29	28.05	33.33	35.10	54.17	23.70	49.40	17.36	72.92	38.95
p-value[(a)]			**0.688**		**0.941**		**0.505**		**0.334**		**0.468**		**0.895**	

Note: (a) One Way ANOVA, (b) Independent sample t-test, (*) p-value < 0.05 (Statistically significant).

Table 5 presents the knowledge scores across different participant characteristics, broken down by age, gender, education level, and years of experience. Key findings include: Older age groups (41 - 50 years) and those with >20 years of experience showed slightly higher scores in some domains, such as prevention and specific patient groups. Male participants scored significantly higher in "Classification" (p-value = 0.030), suggesting a gender difference in understanding this domain. Educational qualifications also influenced specific domain scores, with diploma holders performing better in "Specific Patient Groups" but showing variability in other domains. Statistical significance was limited across comparisons, with most p-values > 0.05.

4. Discussion

Variable results have been reported regarding the Knowledge and attitudes of nurses towards pressure injury prevention worldwide. However, it is essential to note that the specific Knowledge and attitudes of nurses towards pressure injury prevention may differ from their overall understanding of standard precautions. Different studies have reported varying results regarding nurses' Knowledge of PI prevention. The results indicated that nurses' level of Knowledge on PI prevention ranged from 28% to 74%. Considering the importance of improving nurses' Knowledge on PI prevention [15]. In this study, the mean percentage knowledge score for nurses was 48.32%, as assessed using PUKAT. A similar study conducted in Saudi Arabia by Alshahrani documented the average pre-intervention scores of nurses knowledge toward pressure injury prevention at 34.22% [16]. Sallam and her team reported low unsatisfactory knowledge scores of 40.53%. [17]. Furthermore, Halász *et al.* report that nurses exhibited inadequate Knowledge (45.5%) and attitudes (67.9%) [18]. According to the findings of a recently published systematic review and meta-analysis, overall Knowledge of nurses on PI prevention was lower than the recommended level (60%) [15].

This study found that none of the factors—age, gender, education, and experience—showed a significant difference in knowledge scores among nurses; similarly, some recent studies have reported the same findings. Sallam and her team

found that no significant difference exists in the mean scores of nurses according to age, gender, educational attainment, clinical unit, years of working experience, and years since attending the last pressure ulcer training [17]. Additionally, Mustafa Shouli's study found that the knowledge score did not exhibit a significant difference in relation to age, place of work, or years of experience; however, significant differences were observed in knowledge scores among nurses based on gender and academic qualification [19]. Furthermore, Serap Korkmaz, in his study, reported that educational degree and the status of having training about pressure injuries did not affect the total mean score of the Knowledge Test and the Attitude Scale [11]. In contrast, Halász found that the education status of nursing staff and working department had a significant impact on Knowledge [18]. Şahan & Güler report that demographic factors such as gender, educational background, years of experience, and unit of employment were significant predictors of both PUKAT 2.0 scores and APuP scores [20]. According to research by Alshahrani knowledge about preventing pressure injuries was found to be significantly influenced by characteristics such as age, clinical nursing experience, and exposure to critical care facilities. A bachelor's degree or above was associated with improved attitudes and Knowledge about preventing pressure injuries [16]. This study was supported by another study which demonstrated that individuals with higher educational levels, such as those holding a bachelor's degree, possessed satisfactory Knowledge of pressure injury prevention [21].

Arzu Aslan, in his study, reported a higher attitude score of nurses towards pressure ulcer prevention. *i.e.*, 84.12 ± 8.25, which was significantly higher than that of this study, which was 68.68 ± 6.36 [22]. However, studies have reported positive effects of education on knowledge and attitude scores for pressure injury prevention. In another study, the Modified Pieper Pressure Ulcer Knowledge Test scores of the nurses were found to have a statistically significant effect on the scores of the Attitude toward Pressure Injury Prevention Scale (p-value < 0.05) [11]. Similar findings were observed in this study, which revealed a significant association between the participants' educational background and their attitude score levels ($p = 0.018$). A bachelor's degree showed a more satisfactory attitude than those with other degrees. However, it was observed that nurses with higher education had higher attitude scores compared to nurses with lower educational status. Mustafa Shouli, in his study, reports that qualification, place of work, and years of experience showed no significant difference for attitude score [19].

Most studies worldwide indicate that the Knowledge, attitudes, and practices of nurses regarding the prevention of pressure injuries are not at the desired level, despite nurses playing a crucial role in managing these injuries [11].

According to Systematic Review and Meta-Analysis studies conducted in various countries across Asia, the Middle East, and Türkiye within the last five years, the relationships among Knowledge, attitude, and practices toward pressure injury prevention among registered nurses were examined and summarized. From a worldwide perspective, the study found both positive and negative correlations,

which are influenced by several confounding and mediating factors, including hospital-related, nursing-related, and sociodemographic characteristics [23].

Barakat Johnson, in his study conducted in Australia, reported a significant positive correlation between nursing knowledge and attitude towards pressure injury [24]. Similarly, a study conducted in Turkey found a Positive correlation between the total knowledge score and the total attitude score (p-value = 0.007) [20]. Furthermore, a study carried out by Zhang *et al.* reported a positive relationship among nurses' Knowledge, attitudes, and practices in preventing pressure injuries, indicating that an increase in the level of Knowledge is correlated with favorable attitudes and improved practices [25]. In Slovakia, Halász *et al.* identified A significant positive correlation between their knowledge and attitudes ($p = 0.300$; $p < 0.001$) [18]. Similarly, Charalambous study shows a positive correlation between knowledge and attitude score. *i.e.* ($r = 0.233$, p-value = 0.019) [26].

Contrary to the results regarding the correlation between Knowledge and attitude, the correlation coefficient ($r = 0.074$) and p-value (0.141) indicate a very weak, non-significant positive relationship. A study from Rwanda's findings is in line with the results of this study, showing a lower positive correlation between nurses' Knowledge and their attitudes ($r = 0.178$, $p = 0.078$) [27].

On the Other hand, Niyongabo reported a significant negative correlation was identified between the knowledge and attitude scores of the nurses ($r = -0.479$, $p = 0.015$) [28]. In another study from Iran, a negative correlation was observed between Knowledge and attitudes ($r = -0.156$, $p = 0.035$) regarding pressure injury prevention [29]. Mustafa Shouli reported no significant relationship between Knowledge and attitude regarding pressure injury preventive measures among nurses [19].

The relationship between Knowledge and attitude can be understood more closely by examining factors such as Confidence, education, cultural elements, and clinical experience. It would seem that Knowledge is a prerequisite to having the power to make a decision, while aiming to do something requires having the proper Knowledge. Both aspects should be incorporated through training, organizational support, and both material and non-material resources to advance the practices of pressure injury prevention.

Nurses' Knowledge of pressure injury risk assessment and preventive strategies is a crucial aspect of effective pressure injury management. Identifying patients at increased risk of developing pressure injuries and implementing appropriate preventive measures can significantly reduce the incidence and severity of these injuries. By understanding the gaps in Knowledge and the prevailing attitudes, healthcare organizations can develop targeted educational programs and implement evidence-based interventions to enhance the nurses' ability to prevent and manage pressure injuries effectively. Provide comprehensive education and training programs to ensure nurses have a clear understanding of pressure injury prevention protocols [30]. Include information on risk assessment, early identification, and appropriate interventions. Offer regular updates and refresher courses to keep nurses up-to-date with the latest evidence-based guidelines [31]. The

Prevalence of hospital-acquired PIs decreased from 7.5% to less than 4% in Saudi Arabia after using an evidence-based risk assessment tool [32]. The Prevalence of PI decreased from 6.7% to 1.9% in Australia as a result of a specific training program developed over four years [13].

5. Recommendations

According to the study results, future research will involve an interventional study to improve nurses' Knowledge and attitudes toward pressure injury prevention by developing effective strategies. Proposed intervention tools include training workshops, lectures, presentations, and educational programs.

6. Conclusion

The results of this study demonstrate that the nurse's knowledge and attitude scores were unsatisfactory regarding pressure injury prevention. However, in the knowledge domain, nurses' Knowledge was high for specific patient groups, classification, and observation, as well as for nutrition. For the attitude domain, the highest scores were observed for Confidence in the effectiveness of prevention, followed by Priority of Prevention and Personal Competence for Prevention.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

[1] Li, Z., Lin, F., Thalib, L. and Chaboyer, W. (2020) Global Prevalence and Incidence of Pressure Injuries in Hospitalised Adult Patients: A Systematic Review and Meta-analysis. *International Journal of Nursing Studies*, **105**, Article ID: 103546. https://doi.org/10.1016/j.ijnurstu.2020.103546

[2] Mervis, J.S. and Phillips, T.J. (2019) Pressure Ulcers: Pathophysiology, Epidemiology, Risk Factors, and Presentation. *Journal of the American Academy of Dermatology*, **81**, 881-890. https://doi.org/10.1016/j.jaad.2018.12.069

[3] Elnasieh, D.A.M., Mesned, D.M.A., qahatani, D.F.A., Hazmi, D.A.A., Alshamarri, M.B., Alhuwaidi, D.F., *et al.* (2024) The Prevalence and Associated Risk Factors of Pressure Injury among Adults at King Saud Medical City, Riyadh. *Saudi Journal of Medicine*, **9**, 266-275. https://doi.org/10.36348/sjm.2024.v09i07.008

[4] Al-Hashemi, H. (2019) Incidence, Prevalence, and Complications of Pressure Ulcers in General Medical and Surgical Units Using a Multidisciplinary Model (Prospective Cohort). *Biomedical Journal of Scientific & Technical Research*, **18**, 13340-13343. https://doi.org/10.26717/bjstr.2019.18.003109

[5] Tayyib, N., Coyer, F. and Lewis, P. (2015) Saudi Arabian Adult Intensive Care Unit Pressure Ulcer Incidence and Risk Factors: A Prospective Cohort Study. *International Wound Journal*, **13**, 912-919. https://doi.org/10.1111/iwj.12406

[6] Fulbrook, P., Lawrence, P. and Miles, S. (2019) Australian Nurses' Knowledge of Pressure Injury Prevention and Management: A Cross-Sectional Survey. *Journal of Wound, Ostomy & Continence Nursing*, **46**, 106-112. https://doi.org/10.1097/won.0000000000000508

[7] Hess, C.T. (2020) Classification of Pressure Injuries. *Advances in Skin & Wound*

Care, **33**, 558-559. https://doi.org/10.1097/01.asw.0000697324.90597.6d

[8] Awoke, N., Tekalign, T., Arba, A. and Lenjebo, T.L. (2022) Pressure Injury Prevention Practice and Associated Factors among Nurses at Wolaita Sodo University Teaching and Referral Hospital, South Ethiopia: A Cross-Sectional Study. *BMJ Open*, **12**, e047687. https://doi.org/10.1136/bmjopen-2020-047687

[9] Al Aboud, A.M. and Manna, B. (2018) Wound Pressure Injury Management.

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

[11] Korkmaz, S., Sönmez, M. and Gürlek Kısacık, Ö. (2023) The Effect of Knowledge Levels of Intensive Care Nurses about Pressure Injuries on Their Attitude toward Preventing Pressure Injuries. *Journal of Tissue Viability*, **32**, 325-332. https://doi.org/10.1016/j.jtv.2023.04.003

[12] Falk-Brynhildsen, K., Raepsaet, C., Wistrand, C., Leo Swenne, C., Gifford, M., Gunningberg, L., *et al.* (2022) The Swedish Version of the Attitude Towards Pressure Ulcer Prevention Instrument for Use in an Operating Room Context (APUP-OR): A Nationwide Psychometric Evaluation. *Journal of Tissue Viability*, **31**, 46-51. https://doi.org/10.1016/j.jtv.2021.12.005

[13] Manderlier, B., Van Damme, N., Vanderwee, K., Verhaeghe, S., Van Hecke, A. and Beeckman, D. (2017) Development and Psychometric Validation of PUKAT 2·0, a Knowledge Assessment Tool for Pressure Ulcer Prevention. *International Wound Journal*, **14**, 1041-1051. https://doi.org/10.1111/iwj.12758

[14] Beeckman, D., Defloor, T., Schoonhoven, L. and Vanderwee, K. (2011) Knowledge and Attitudes of Nurses on Pressure Ulcer Prevention: A Cross-Sectional Multicenter Study in Belgian Hospitals. *Worldviews on Evidence-Based Nursing*, **8**, 166-176. https://doi.org/10.1111/j.1741-6787.2011.00217.x

[15] Dalvand, S., Ebadi, A. and Ghanei Gheshlagh, R. (2018) Nurses' Knowledge on Pressure Injury Prevention: A Systematic Review and Meta-Analysis Based on the Pressure Ulcer Knowledge Assessment Tool. *Clinical, Cosmetic and Investigational Dermatology*, **11**, 613-620. https://doi.org/10.2147/ccid.s186381

[16] Alshahrani, B., Middleton, R., Rolls, K. and Sim, J. (2023) Critical Care Nurses' Knowledge and Attitudes toward Pressure Injury Prevention: A Pre and Post Intervention Study. *Intensive and Critical Care Nursing*, **79**, Article ID: 103528. https://doi.org/10.1016/j.iccn.2023.103528

[17] Sallam, S.A.E.G., Dando, L.L., Velitario, A.M., Pardinas, A.L.A., Dizon, M.L. and Alcantara, J.C. (2020) Nurses' Knowledge to Pressure Ulcer Prevention at Hail Hospitals in Saudi Arabia: A Cross-Sectional Study. *Medical Science*, **24**, 4040-4052.

[18] Grešš Halász, B., Bérešová, A., Tkáčová, Ľ., Magurová, D. and Lizáková, Ľ. (2021) Nurses' Knowledge and Attitudes towards Prevention of Pressure Ulcers. *International Journal of Environmental Research and Public Health*, **18**, Article No. 1705. https://doi.org/10.3390/ijerph18041705

[19] Shouli, M., Bsharat, R., Khalid, H.A. and Shoul, K. (2024) Knowledge and Attitude among Nurses Towards Pressure Ulcer Prevention at Palestinian Hospital. *Open Journal of Nursing*, **14**, 637-656. https://doi.org/10.4236/ojn.2024.1412047

[20] Şahan, S. and Güler, S. (2024) Evaluating the Knowledge Levels and Attitudes regarding Pressure Injuries among Nurses in Turkey. *Advances in Skin & Wound Care*, **37**, 1-8. https://doi.org/10.1097/asw.0000000000000195

[21] Lotfi, M., Aghazadeh, A.M., Asgarpour, H. and Nobakht, A. (2019) Iranian Nurses'

Knowledge, Attitude and Behaviour on Skin Care, Prevention and Management of Pressure Injury: A Descriptive Cross-Sectional Study. *Nursing Open*, **6**, 1600-1605. https://doi.org/10.1002/nop2.365

[22] Aslan, A. and Yavuz van Giersbergen, M. (2016) Nurses' Attitudes towards Pressure Ulcer Prevention in Turkey. *Journal of Tissue Viability*, **25**, 66-73. https://doi.org/10.1016/j.jtv.2015.10.001

[23] Asiri, M.Y., Baker, O.G., Alanazi, H.I., Alenazy, B.A., Alghareeb, S.A., Alghamdi, H.M., *et al.* (2025) Nurses' Knowledge, Attitudes, and Practices in Pressure Injury Prevention: A Systematic Review and Meta-Analysis. *Healthcare*, **13**, Article No. 1220. https://doi.org/10.3390/healthcare13111220

[24] Barakat-Johnson, M., Barnett, C., Wand, T. and White, K. (2018) Knowledge and Attitudes of Nurses toward Pressure Injury Prevention: A Cross-Sectional Multisite Study. *Journal of Wound, Ostomy & Continence Nursing*, **45**, 233-237. https://doi.org/10.1097/won.0000000000000430

[25] Zhang, H., Ma, Y., Wang, Q., Zhang, X. and Han, L. (2022) Incidence and Prevalence of Pressure Injuries in Children Patients: A Systematic Review and Meta-Analysis. *Journal of Tissue Viability*, **31**, 142-151. https://doi.org/10.1016/j.jtv.2021.07.003

[26] Charalambous, C., Koulouri, A., Roupa, Z., Vasilopoulos, A., Kyriakou, M. and Vasiliou, M. (2019) Knowledge and Attitudes of Nurses in a Major Public Hospital in Cyprus Towards Pressure Ulcer Prevention. *Journal of Tissue Viability*, **28**, 40-45. https://doi.org/10.1016/j.jtv.2018.10.005

[27] Mwiseneza, M.J. (2017) Nurses' Knowledge, Attitudes and Practices Regarding Prevention of Pressure Ulcers in a Selected District Hospital in Rwanda. Doctoral Dissertation, University of Rwanda. http://dr.ur.ac.rw/handle/123456789/379

[28] Niyongabo, E., Gasaba, E., Niyonsenga, P., Ndayizeye, M., Ninezereza, J.B., Nsabimana, D., *et al.* (2022) Nurses' Knowledge, Attitudes and Practice Regarding Pressure Ulcers Prevention and Treatment. *Open Journal of Nursing*, **12**, 316-333. https://doi.org/10.4236/ojn.2022.125022

[29] Ghazanfari, M.J., Karkhah, S., Maroufizadeh, S., Fast, O., Jafaraghaee, F., Gholampour, M.H., *et al.* (2022) Knowledge, Attitude, and Practice of Iranian Critical Care Nurses Related to Prevention of Pressure Ulcers: A Multicenter Cross-Sectional Study. *Journal of Tissue Viability*, **31**, 326-331. https://doi.org/10.1016/j.jtv.2022.01.009

[30] Jiang, L., Li, L. and Lommel, L. (2020) Nurses' Knowledge, Attitudes, and Behaviours Related to Pressure Injury Prevention: A Large-Scale Cross-Sectional Survey in Mainland China. *Journal of Clinical Nursing*, **29**, 3311-3324. https://doi.org/10.1111/jocn.15358

[31] Awali, Z.M., Nagshabandi, E.A. and Elgmail, A. (2018) The Effect of Implementing Pressure Ulcer Prevention Educational Protocol on Nurses' Knowledge, Attitude and Practices. *Nursing & Primary Care*, **2**, 1-7. https://doi.org/10.33425/2639-9474.1077

[32] Al-Otaibi, Y.K., Al-Nowaiser, N. and Rahman, A. (2019) Reducing Hospital-Acquired Pressure Injuries. *BMJ Open Quality*, **8**, e000464. https://doi.org/10.1136/bmjoq-2018-000464