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Research Article

Assessment of Undergraduate Nursing Students' Knowledge Regarding Pressure Ulcers

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Abstract

Background: Pressure ulcers are a global patient safety concern, yet nursing students often lack adequate knowledge, particularly in preventive measures. Objectives: This study aimed to assess the level of knowledge regarding pressure ulcer prevention among undergraduate nursing students at the Fujairah University. The study may underscore the significance of early education and clinical exposure in enhancing students' preparedness for effective pressure ulcer management. Method: A cross-sectional quantitative study was conducted using the validated Pressure Ulcer Knowledge Assessment Tool (PUKAT 2.0). Convenience sampling was used to recruit participants from year 2, year3, and year 4 nursing students. Data were collected through an online self-administered questionnaire. A total of 149 responses were analyzed using PSPP software to perform descriptive and inferential statistical analysis. Results: Only 25% of students demonstrated high knowledge, while 38% had low knowledge level. Major gaps were identified in prevention and nutrition, while better knowledge score was noted in risk assessment and care for specific patient groups. Knowledge levels were significantly associated with academic year, CGPA, clinical experience, and previous exposure to pressure ulcer cases.

Conclusion: The study identifies key knowledge gaps in pressure ulcer prevention among nursing students. Findings support the need for curriculum improvement, increased hands-on training, and early clinical exposure. These insights can help guide nursing educators and institutions in developing more effective training programs.

Limitations: This study was conducted in a single institution with a limited sample size, which may affect the generalizability of the findings.

Keywords: Clinical exposure, curriculum development, nursing student knowledge, PUKAT 2.0., pressure ulcer, undergraduate.

Introduction

Nursing students are crucial for providing high-quality patient care. As aspiring healthcare providers, they must have a solid background in a variety of clinical procedures, including pressure ulcer treatment. Studies reveal notable gaps in their knowledge of important preventive techniques, including risk assessment, regular repositioning, and the application of pressure-relieving equipment. To guarantee that students are equipped to carry out successful preventative actions and satisfy the requirements of contemporary healthcare, these deficiencies must be filled[1].

Knowledge is a key component of nursing practice, which includes the capacity to properly evaluate, plan, and carry out preventive care. Gaining a thorough understanding of pressure ulcers is essential for nursing students. This entails being aware of the pathophysiology, recognizing early signs, identifying patients who are at risk, and putting evidence-based preventative techniques into practice. However, studies reveal that many nursing students are not well-versed in these areas, highlighting the necessity of focused educational interventions to close the gap and improve clinical competency[2].

Pressure ulcers (PUs), also known as pressure injuries, are localized injuries to the skin and underlying tissues resulting from prolonged pressure or shear. They are commonly associated with immobility and represent a significant challenge in healthcare settings due to their adverse effects on patient outcomes, including increased morbidity, longer hospital stays, and higher treatment costs[3]. Florence Nightingale emphasized their significance as early as 1859, noting that bedsores are typically indicative of poor nursing care[4].

Despite the well-documented consequences of pressure ulcers and available prevention strategies, numerous studies report a persistent lack of adequate knowledge among nursing students regarding their prevention[5]. This gap jeopardizes patient safety and compromises care quality. The present study seeks to determine the level of current knowledge of undergraduate nursing students at one of the higher education institutions regarding pressure ulcers also to assess the relationship between the demographic characteristics of undergraduate nursing students and their levels of knowledge regarding pressure ulcers

Methods

A cross-sectional quantitative research design was employed to assess the knowledge level of undergraduate nursing students regarding pressure ulcer prevention. This approach facilitated the collection of numerical data at a single point in time using a structured and validated instrument.

The study was conducted at the College of Health Sciences, Fujairah University, and targeted both male and female undergraduate students enrolled in the Bachelor of Science in Nursing (BSN) program. Participants were selected from BSN2, BSN3, and BSN4 academic levels. Convenience sampling was used to recruit all available students at the time of data collection: 70 from BSN2, 78 from BSN3, and 77 from BSN4. Stratification was employed during analysis to ensure appropriate representation from each academic year. The final sample size consisted of students who completed the survey voluntarily and met the inclusion criteria.

Eligible participants were those currently enrolled in the BSN program, specifically from BSN2, BSN3, or BSN4, and willing to provide informed consent. Students on academic leave or deferment at the time of data collection were excluded.

The Pressure Ulcer Knowledge Assessment Tool (PUKAT 2.0) was used to assess knowledge levels6. This validated instrument consists of 25 multiple-choice questions covering six domains: etiology, classification and observation, risk assessment, nutrition, prevention strategies, and specific patient groups. Each correct answer was scored as one point, while incorrect and

"I don't know" responses were scored as zero. The total score ranged from 0 to 25, and knowledge levels were categorized as low (0–8), moderate (9–17), and high (18–25). The tool has demonstrated high reliability (Cronbach's alpha > 0.8) and acceptable test-retest consistency (ICC = 0.69). It was adapted to align with updated international guidelines and included clinical case-based questions and illustrative content.

An additional section was added to the tool to collect demographic information including age, gender, academic year, GPA, exposure to pressure ulcer-related theory and relevant courses, clinical experience, and prior contact with patients suffering from pressure ulcers. The final questionnaire was prepared in digital format using Google Forms for ease of distribution.

Data collection occurred in three phases. First, the tool was reviewed and formatted to include a demographic section and informed consent form. In the second phase, the Google Form link was distributed electronically via university email and through QR codes displayed on campus. Students accessed the survey using their mobile devices and were informed that completion would take approximately 10 minutes. Participation was entirely voluntary and anonymous.

A total of 149 valid responses were obtained. In the final phase, responses were exported and analyzed using PSPP software. Descriptive statistics summarized demographic data and knowledge levels. Inferential statistics, including ANOVA and chi-square tests, were employed to examine associations.

Results

The majority of students (81.9%) were aged between 20–22 years, with a female predominance (63.1%). Most participants were in their final academic year (BSN4, 41.6%). Regarding academic performance, 42.3% had a CGPA between 3.00–3.49, table (1). All students had been exposed to pressure ulcer theory, mainly through Adult Health Nursing and Comprehensive Health Assessment courses. Additionally, 71.8% reported prior clinical experience, and 66.4% had encountered patients with pressure ulcers, table (2).

Table (1): Demographic Data (Age, Gender, Academic Year, and CGPA):

Variable	Frequency (N)	Percentage (%)
Age		
17-19	12	8.1%
20-22	122	81.9%
23-25	15	10.1%
Mean Age in years with SD	21.06 ± 0.89	
Gender		
Male	55	36.9%
Female	94	63.1%
Academic Year		
BSN2	42	28.2%
BSN3	45	30.2%
BSN4	62	41.6%
CGPA		
2.00-2.49	1	0.7%
2.50-2.99	24	16.1%
3.00-3.49	63	42.3%
3.50-3.89	55	36.9%
3.90-4.00	6	4.0%
Mean CGPA with SD	3.31 ± 0.39	

Table (2): Demographic Data (Prior Exposure to Pressure Ulcer Theory, Courses where Students Exposed to Pressure Ulcer Theory, Prior Clinical Experience, and Prior Exposure to a Patient with Pressure Ulcers in the Clinical Setting):

Variable	Frequency (N)	Percentage (%)
Prior Exposure to Pressure Ulcer Theory Part in the Curriculum		
- Yes	149	100%
- No	0	0%
Courses where Students Exposed to Pressure Ulcer Theory Part		
- Comprehensive Health Assessment Course	42	28.2%
- Adult Health Nursing 2 Course and Comprehensive Health Assessment Course	107	71.8%
Prior Clinical Experience		
- Yes	107	71.8%
- No	42	28.2%
Prior Exposure to a Patient with Pressure Ulcers in the Clinical Setting		
- Yes	99	66.4%
- No	50	33.6%

The internal consistency of the PUKAT 2.0 instrument was high (Cronbach's alpha = 0.902) Table (3). Among the participants, 38% demonstrated low knowledge, 37% moderate, and only 25% high knowledge, figure (1). The domain with the highest average performance was risk assessment (mean = 1.31/2), followed by specific patient groups and classification. Nutrition and prevention were the weakest domains, highlighting knowledge gaps in essential preventive strategies.

Table (3): Reliability of PUKAT:

Item	No. of Items	Min-Max Score	Cronbach's Alpha
PUKAT	25	0–25	0.902

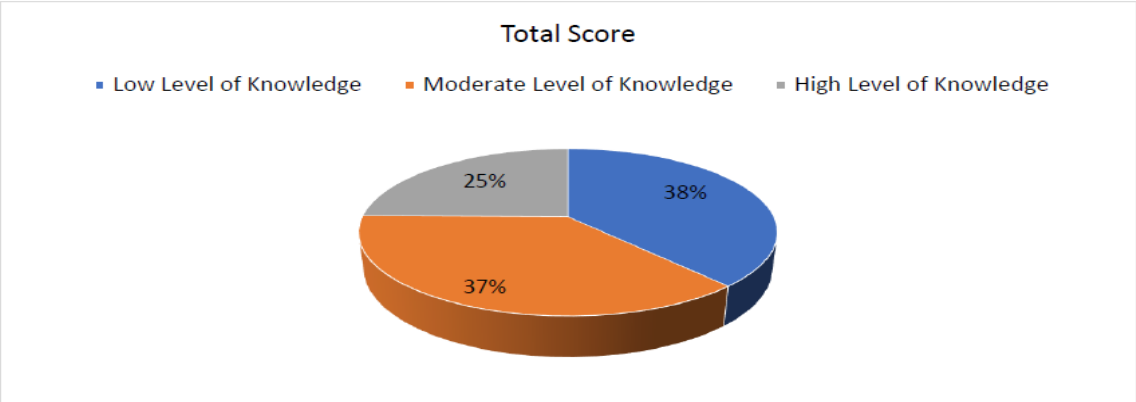

Figure (1): Distribution of Total Knowledge Levels Among Nursing Students

As appears in table (5,6,7 &8), Statistical analysis revealed significant associations ($p < 0.05$) between knowledge level and academic year, CGPA, clinical experience, and exposure to pressure ulcers accordingly.

Table (5): Comparison of Pressure Ulcer Knowledge Scores by Academic Year (BSN2, BSN3, BSN4) Across Different Themes:

Themes	BSN2 (Mean ± SD)	BSN3 (Mean ± SD)	BSN4 (Mean ± SD)	F-Value	P-Value
Etiology	1.57 ± 1.65	2.71 ± 1.58	3.68 ± 1.58	22.17	.000*
Classification & Observation	1.48 ± 1.17	2.18 ± 1.24	2.52 ± 1.33	9.29	.000*
Risk Assessment	0.88 ± 0.63	1.24 ± 1.07	1.35 ± 1.23	5.53	.005*
Nutrition	0.79 ± 0.98	1.24 ± 1.07	1.65 ± 1.22	7.47	.001*
Prevention of Pressure Ulcers	2.33 ± 1.72	3.20 ± 1.78	4.06 ± 2.56	8.39	.000*
Specific Patient Groups	0.64 ± 0.76	1.09 ± 0.82	1.34 ± 0.91	9.52	.000*
Total Score	7.69 ± 5.26	11.67 ± 5.37	14.60 ± 6.82	16.65	.000*

F= One-way ANOVA, *Statistically significant at $p \leq 0.05$

Table (6): The Relationship between the Students' CGPA and their Levels of Knowledge regarding Pressure Ulcers:

Total Knowledge Level	CGPA						Pearson Chi-Square (χ^2)	p-value
	2.00-2.49 (n, %)	2.50-2.99 (n, %)	3.00-3.49 (n, %)	3.50 -3.89 (n, %)	3.90-4.00 (n, %)	Total (n, %)		
Low	1 (100.0%)	12 (50.0%)	22 (34.9%)	19 (34.5%)	3 (50.0%)	57 (38.3%)	20.33	0.009*
Moderate	0 (0.0%)	10 (41.7%)	31 (49.2%)	13 (23.6%)	1 (16.7%)	55 (36.9%)		
High	0 (0.0%)	2 (8.3%)	10 (15.9%)	23 (41.8%)	2 (33.3%)	37 (24.8%)		

χ^2= Pearson Chi-Square, *Statistically significant at $p \leq 0.05$

Table (7): The Relationship between the Students' Prior Clinical Experience and their Levels of Knowledge regarding Pressure Ulcers:

Total Knowledge Level	Prior Clinical Experience			Pearson Chi-Square (χ^2)	p-value
	Yes (n, %)	No (n, %)	Total (n, %)		
Low	32 (29.9%)	25 (59.5%)	57 (38.3%)	13.00	0.002*
Moderate	42 (39.3%)	13 (31.0%)	55 (36.9%)		
High	33 (30.8%)	4 (9.5%)	37 (24.8%)		

χ^2= Pearson Chi-Square, *Statistically significant at $p \leq 0.05$

Table (8): The Relationship between the Students' Prior Exposure to a Patient with Pressure Ulcers in the Clinical Setting and their levels of knowledge regarding pressure ulcers:

Total Knowledge Level	Prior Clinical Exposure to a Patient with Pressure Ulcers in the Clinical Setting			Pearson Chi-Square (χ^2)	p-value
	Yes (n, %)	No (n, %)	Total (n, %)		
Low	28 (28.3%)	29 (58.0%)	57 (38.3%)	20.84	0.000*
Moderate	36 (36.4%)	19 (38.0%)	55 (36.9%)		
High	35 (35.4%)	2 (4.0%)	37 (24.8%)		

χ^2= Pearson Chi-Square, *Statistically significant at $p \leq 0.05$

Discussion

The findings of this study reveal considerable knowledge deficits among nursing students regarding pressure ulcer prevention, especially in the domains of nutrition and preventive strategies. This aligns with previous research indicating that theoretical knowledge often does not translate effectively into clinical competence[2,7].

The current study revealed that only 25% of undergraduate nursing students demonstrated a high level of knowledge, while 38% fell into the low-knowledge category. These findings are aligned with trends reported in global literature, where nursing students consistently show moderate to inadequate levels of knowledge regarding pressure ulcer prevention.

For instance, another study reported that only 4.5% of students achieved a satisfactory score (≥60%) using the original PUKAT, reflecting a lower knowledge level than in the present study8. Similarly, Chami et al. recorded a mean score of 5.88/25 (23.5%) using the French version of PUKAT 2.0, with widespread deficiencies across all domains[2]. Different study found low average scores among Jordanian students (32.8%) and moderately better performance among Turkish students (46.9%), consistent with the present study's indication of insufficient competency in key themes.[9]

By contrast, Alshahrani et al.[10] and Kara et al.[11] reported relatively higher overall scores (48.7% and 49.9%, respectively), though still below optimal. In the systematic review study13, a global pooled knowledge score of 48.9% for students was reported, nearly matching the estimated knowledge range inferred from the present study's theme-based averages.

The current study found the highest knowledge score in risk assessment (59.7%), followed by specific patient groups (53.4%), while the lowest scores were in prevention (41.4%), nutrition (42.9%), and etiology (45.6%). These findings are consistent with Bobbink et al.[12], who, before a blended-learning intervention, reported risk assessment (64.5%) as their strongest domain and prevention (34.5%) as the weakest using PUKAT 2.0. similarly identified prevention as the lowest-performing theme across multiple studies globally[13].

On the other hand, some studies showed notable thematic contrasts. For example, two studies reported nutrition as their strongest domain, scoring 71.4% and 72% respectively, while it ranked among the weakest in the present study[1,11]. Isa et al. also recorded nutrition (63.7%) as the top-scoring theme, further emphasizing the need to improve the curriculum's focus on nutrition's role in pressure injury prevention in the current context[8].

Moreover, prevention, the lowest theme in the present study (41.4%), was also the weakest in Chami et al., Daibes et al., and Wu et al.2,9,13, reinforcing that this domain is globally under-addressed in undergraduate nursing education.
The present study demonstrated statistically significant associations between students' total knowledge levels and several demographic variables: academic year ($p = 0.000$), cumulative GPA ($p = 0.009$), prior clinical experience ($p = 0.002$), and prior clinical exposure to patients with pressure ulcers ($p = 0.000$). These findings align closely with international literature, with some results demonstrating even more pronounced differences than reported in earlier studies.

In terms of academic year, our findings revealed that 43.5% of BSN4 students had high knowledge levels, compared to 15.6% of BSN3 and only 7.1% of BSN2 students. Additionally, 61.9% of BSN2 students scored in the low knowledge category, indicating a clear progression in knowledge with advancing academic level. This is consistent with Kara et al.11, who found significantly higher mean knowledge scores among senior students (mean score: 14.85/26 or 57.1%) compared to lower-year students. Similarly, Daibes et al. reported

that fourth-year Turkish nursing students achieved a mean score of 46.9%, while Jordanian students averaged 32.8%, showing a notable increase with academic advancement[9].

Regarding cumulative GPA, students with a GPA of 3.50–3.89 and 3.90–4.00 had the highest proportion of high knowledge scores (41.8% and 33.3%, respectively), while no high scorers were recorded among students with a GPA below 2.5. This positive association between GPA and knowledge aligns with findings from Murugiah et al.1, who reported that degree-level students (often with stronger academic standing) had higher scores than diploma students (mean score: 40.2%). Similarly, Daibes et al.9 observed higher scores among students from public universities—typically with higher academic performance—compared to those from private universities.

Prior clinical experience also proved to be a key factor. Among students with clinical experience, 30.8% reached a high knowledge level, compared to only 9.5% of those without experience. This is supported by Isa et al.8, who reported that students without wound care exposure performed poorly, especially in prevention-related domains. Chami et al.2 similarly found that students who lacked practical contact with pressure ulcer cases or equipment (e.g., redistribution mattresses) had significantly lower scores.

The strongest association in our study was observed with prior clinical exposure to a patient with pressure ulcers, where 35.4% of exposed students achieved high knowledge scores compared to only 4.0% of those without such exposure. This finding underscores the importance of hands-on patient care and supports the conclusions of Ghobadi-Larimi et al.[14], who emphasized the value of real patient encounters in reinforcing theoretical knowledge.

In contrast, age and gender were not significantly associated with knowledge scores in our study, a result echoed by Wu et al.13and Kara et al.11, who reported no consistent correlation between these variables and pressure ulcer knowledge.

Ethical Considerations

Ethical approval for the study was granted by the Research Ethics Committee at the University of Fujairah (No. EA#6). Participation was voluntary, and informed consent was obtained from each participant. Data were anonymized and securely stored, ensuring confidentiality and compliance with institutional and international ethical standards.

Limitations

This study was conducted in a single institution with a limited sample size, which may affect the generalizability of the findings. Convenience sampling could also introduce bias, as highly motivated students may have been more likely to participate. Additionally, the use of a self-administered questionnaire may have influenced the accuracy of responses.

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Conflict of interest

No conflict of interest declared.

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