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Knowledge and Attitude among Nurses towards Pressure Ulcer Prevention at Palestinian Hospital

Mustafa Shouli[1], Rebhi Bsharat[2], Hamdallah Abu Khalid[1], Khaila Shoul[1]

[1]Nursing Department, Nablus University for Vocational and Technical Education, Nablus, Palestine
[2]Nursing Department, Modern University College (MUC), Ramallah, Palestine
Email: Mustafa.shouli@nu-vte.edu.ps, ribheb@yahoo.com

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Abstract

Background: Pressure ulcers (PU) remain a serious complication of immobile patients and a burden for healthcare professionals. The incidence and prevalence remain alarming. Knowledge and attitudes of nurses play a fundamental role in prevention. The aim of the study is to assess knowledge and attitude towards pressure ulcer prevention in Palestinian hospital. **Methodology:** A quantitative cross-sectional study was conducted at four hospitals in Jenin and Nablus for one month from 1-4-2023 to 1-5-2023, a sample size was 150 participants, who met inclusion and exclusion criteria, and data was collected in three sections: first section was nurse's demographic characteristics, second section was PressureUlcer Prevention Knowledge Assessment Instrument (PUPKAI), and third section was Attitude towards Pressure Ulcer Prevention Instrument (APUP). **Result:** The main result of our study shows that the level of nurse's knowledge regarding PrUs preventive measures at Palestinian hospitals is low, and the level of nurse's attitude regarding PrUs preventive measures at Palestinian Hospitals is high, and there is no significant relationship between knowledge and attitude regarding PrUs preventive measure among nurse's at the Palestinian Hospitals. **Conclusion:** Results showed insufficiencies in the knowledge and attitudes of nurses towards PU prevention. Therefore, it is essential to focus on general education and continuing education and practice of nurses. Further development of educational programs and frequent measurement of these two parameters can lead to a significant improvement in the quality of care provided.

Keywords

Pressure Ulcer, Knowledge, Attitude, Prevention, Nurses

1. Introduction

Pressure ulcers are painful burden for patients/clients of all ages, which causes complications as comfort, pain, quality of life, costs and a long stay in hospitals. They might result in a life-threatening situation. The issue of pressure ulcer incidence is very complex. It includes regulations and auditing, implementation of adequate preventive and treatment procedures, resources, evidence-based practice, educated staff and active involvement of professionals. Despite progressive technologies and successful clinical researches in terms of prevention and treatment, pressure ulcers present high incidence of 7% - 71.6% [1]-[4], and considerably high mortality [5]. The cost of pressure ulcer prevention varies between 2.65 € and 87.57 € a day per patient while the cost of pressure ulcer treatment ranges between 1.71 € and 470.49 € a day per patient [6]. Monitoring the incidence of pressure ulcers in Slovakia has not been unified yet; the problem rests in the inconsistency of evaluation and standardization of pressure ulcers prevention and treatment, insufficiencies in reviews and audits, missing methodological guidance, preventive programs and relevant data collection [7].

There are international and national guidelines for pressure injury prevention in place. According to these guidelines, regular surveys should be carried out among health care professionals to evaluate the educational needs of clinical staff. The knowledge and attitudes of nursing staff towards pressure injury play an essential role in treatment planning, prescribing appropriate prevention measures for each patient, and subsequently evaluating and achieving these preventive measures [8]. In addition, nurses with higher levels of education were found to have better knowledge and skills compared to those with lower levels of education [9] [10]. It has also been shown that negative attitudes towards pressure injury prevention may result in a suboptimal quality of prevention efforts [11].

Medical and surgical units are departments in a hospital that specialize in the proper treatment of certain types of diseases. They provide appropriate care to patients and prevent complications associated with surgery. In these departments, the patients report many physiological variables to the specialty in a systemic manner so that titrated care will be provided when needed [12]. Patients in medical and surgical units are subjected to many complications related to many factors, such as an unfavorable result of a disease, health condition, or treatment, direct intraoperative trauma or stretch, vascular compromise, perioperative infection, hematoma formation, prolonged tourniquet ischemia, or improperly applied casts or dressings. Pressure ulcer (PrUs) is one of these complications which is common in patients due to several factors such as immobilization, nutrition deficiency and Prolonged surgery and anesthesia, specific positions for different operations, excessive blood loss, and physical maneuvering [13].

Adequate standards of care related to pressure ulcers should be implemented on all levels of care and should be one of the priorities of any hospital and home care setting to deliver adequate and high quality of care [14]-[16]. Standardized instructions can significantly prevent pressure ulcers [17] [18]. European Pressure

Ulcer Advisory Panel (EPUAP) sets and regularly reviews standards and procedures of pressure ulcer management on the bases of research. In many cases, it was found that standards and procedures are not used or used insufficiently [19]-[21].

Pressure Ulcers (PUs) are a significant problem in healthcare. They do not only affect the quality of life, morbidity and mortality of patients, but they also have an impact on healthcare costs. According to recent studies in the Asian States, the prevalence of pressure ulcers in Palestine is considerably higher than in China and Jordan. However, it is still lower than the prevalence reported in comparable published studies in Western Europe [22].

This study focuses on assistant nurses at a hospital, in particular, due to their active involvement in pressure injury risk assessment in Palestine. It is crucial to identify the strengths and weaknesses in assistant nurses' knowledge and attitudes about pressure injuries in order to identify potential knowledge gaps and determine what kind of pressure injury training would be the most beneficial for assistant nurses, thus ultimately benefiting patients at risk. To ensure progress in their training, the knowledge and attitudes of assistant nurses need to be investigated and assessed using evidence-based instruments. Therefore, the aim of this study was to assess knowledge and attitude toward prevention of pressure ulcer among nurses in Palestinian hospitals.

Theoretical Framework

Figure 1 and Figure 2 depict the study's theoretical structure, highlighting interconnected components and anticipated relationships between variables. These frameworks guide research methodology, design, data collection, and analysis, ensuring alignment with objectives.

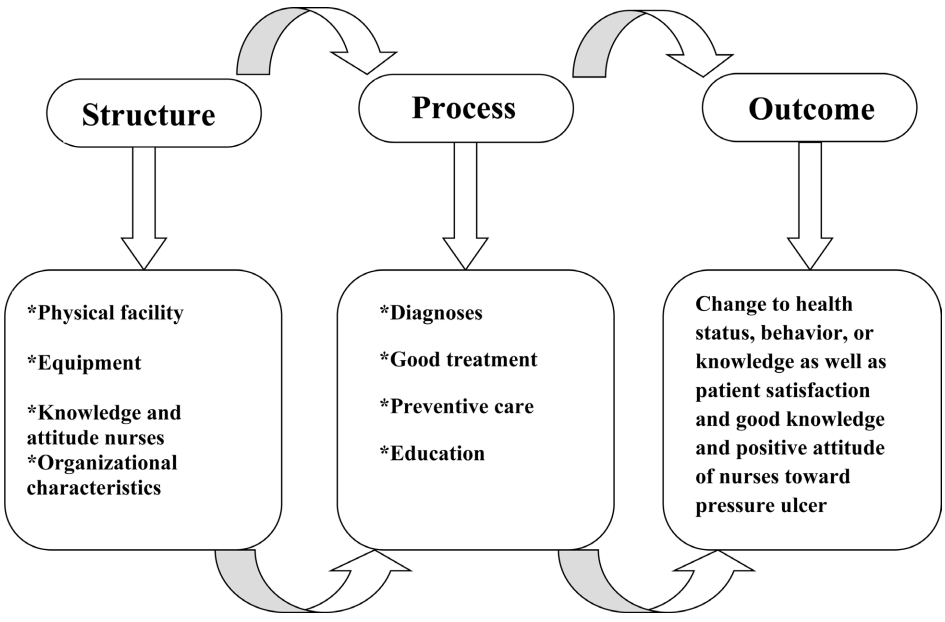

Figure 1. The relationship between the components of framework.

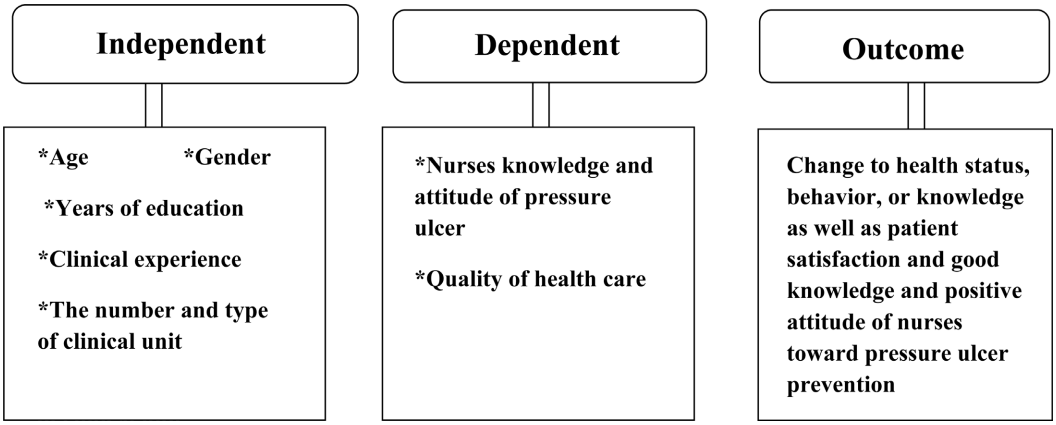

Figure 2. A conceptual framework illustrates the expected relationship between variables.

2. Methodology

2.1. Study Design

A quantitative cross-sectional study was used to assess the knowledge and attitude of nurses toward pressure ulcer prevention in Palestine that was conducted on employees who work at four hospitals in Jenin and Nablus (Jenin governmental hospital and Ibn Sina Specialized hospital-Jenin/Rafeidia hospital and Specialized Arab hospital-Nablus).

2.2. Study Population

This study's target population is all nurse staff working in the medical and surgical departments who have acceptance to participate in this study during the period of data collection for one month from 1st April, 2023 to 1st May, 2023, which is from Palestinian hospitals that selected in Jenin and Nablus.

2.3. Study Setting

This study was conducted non randomly in four hospitals in Palestine where is in Nablus and Jenin (Jenin governmental hospital and Ibn Sina Specialized hospital-Jenin/Rafeidia hospital and Specialized Arab hospital-Nablus) because that is easy to access some of them. These hospitals were chosen to represent a mix of governmental and private healthcare institutions in two major cities, providing a comprehensive overview of the nursing practices and challenges in various healthcare settings within the region.

2.4. Sample Size

In this study, approximately 195 nurses work in the medical and surgical departments of the targeted hospitals. A convenience sample was selected, comprising nurses who were readily accessible during the data collection period. To achieve a 95% confidence level, with a margin of error of ±5%, at least 130 responses were needed. The final sample size met this requirement, consisting of 130 participants.

2.5. Sampling Criteria (Eligibility Criteria)

- **Inclusion criteria:** All Nursing staff working in medical and surgical departments in targeted hospitals. Nurses who accept and meet sample criteria to participate in our study and complete the questionnaire.
- **Exclusion criteria:** Nurses not working in medical and surgical departments in targeted hospitals. Nurses who refuse to participate in our study. Nurses who do not complete the questionnaire. Nurses who are sick or on maternity leave during the data collection period. Student nurse who trained in medical and surgical departments in the targeted hospital.

2.6. Study Instrument

A modified questionnaire was used, it comprised of three sections: The first section from data collection was based on literature reviewed we plan to consist of six questions on nurse's demographic characteristics and clinical experiences, including age, gender, years of education, clinical experience, and the number and types of clinical units. The second section use Ulcer Prevention Knowledge Assessment Instrument (PUPKAI), It included 26 items and six themes, namely, ethology and development (6 items), classification and observation (5 items), risk assessment (2 items), nutrition (1 item), preventive interventions to reduce the amount of pressure/shear (7 items) and preventive measures to reduce the duration of pressure/shear (5 items). Each item had three answers where only one was the correct one.

The third section use Attitude towards Pressure Ulcer Prevention Instrument (APUP) to evaluate the attitudes towards pressure injury (PI) prevention. It included 13 items and 5 subscales, including personal competency to prevent pressure ulcers (3 items), priority of pressure ulcer prevention (3 items), impact of pressure ulcers (3 items), personal responsibility in pressure ulcer prevention (2 items), and confidence in the effectiveness of prevention (2 items). Six items were positive and seven items (items 3, 5, 7, 8, 9, 10, and 13) were negative so that they were reverse scored. Items were rated on a 4-point Likert scale (1 = strongly disagree, 4 = strongly agree) and the possible scores ranged between 13 and 52, with higher scores indicating positive attitudes.

2.7. Ethical Considerations

Ethical approval was obtained from the Institutional Review Board (IRB) at Nablus University for Vocational and Technical Education, and permissions were secured from the Medical Research and Ethics Committee of the Ministry of Health in Palestine, as well as hospital managers. Confidentiality and anonymity were maintained by assigning numbers to participants for data analysis, with no identifying information required on the questionnaires. Participation was voluntary, and written consent was obtained from the nurses. Participants were assured of no harm or risks, and their identities will remain protected if the research is published.

2.8. Validity and Reliability

The study instrument is reliable and valid as it was obtained from evidence based researches: (Pressure ulcer prevention: development and psychometric validation of a knowledge assessment instrument) and (Pressure ulcers: development and psychometric evaluation of the attitude towards pressure ulcer prevention instrument (APuP)). These two articles were published in 2010. The questionnaire was proved to have a good degree of reliability where Cronbach's alpha coefficient was found to be (75%) which is a good degree for such type of research. The results of reliability test for Cronbach's alpha were 0.76.

2.9. Data Collection

The data was collected from 1st April 2023 to 1st May 2023, after we had obtained permission from the medical research and ethics committee of the Ministry of Health in Palestine, as well as from the matrons of the included hospitals in Nablus and Jenin. We then distributed free access, paper-based questionnaires to the nurses present in the departments who met the sampling criteria. Additionally, the questionnaire was circulated in an electronic format on Google Forms and as a soft copy on the social networking sites of the department. Nurses who chose to fill out the soft copy were emailed the questionnaire for completion and submission. The purpose and nature of the study were explained to the participants, and written informed consent was obtained from those involved in the study. A knowledge and practice-based questionnaire was distributed to the participants in two shifts (Morning and Evening Shift B). Participants read and filled out the questionnaire individually, and consulted the researcher for clarification of any unclear information. The questionnaire was designed in two forms: the first was a paper version to be distributed to the participants. Data cleaning was done by inspecting the questionnaires for completeness before they were accepted for data entry.

2.10. Data Analysis

The questionnaires were analyzed by SPSS program using some tests including: Descriptive statistics to find the frequencies, percentages, means and standard deviations. Correlation test to explore the relationship between knowledge and attitude. T-test to find the differences attributed to gender. One-way ANOVA test to find the differences attributed to age, academic qualification, place of work, and years of experience.

3. Results

3.1. Sample Characteristics

Table 1 shows that (50.8%) of the sample were males, and (49.2%) were females. Regarding the age groups, the majority of the sample (63.1%) were within the age group (22-30 years), and (30%) were within the age group (30 - 40 years). Regarding academic qualification, the majority of the sample (74.6%) hold a Bachelor's degree, while (15%) hold Diploma, and (10%) hold Master degree. Place of work

the majority of the sample individuals were from Jenin Governmental Hospital (30.8), while (26.9%) were from Rafidia Hospital and (26.2%) were from Al-Arabi Specialist Hospital. The lowest percentage of participants was from Ibn Sina Hospital (16.2%). The majority of the sample individuals have 5 years of experience or less (57.7), while (23.1%) have 6 - 10 years of experience, and (13.1%) have 11 - 15 years. The lowest percentage of participants was within the experience category (16 years or more).

Table 1. Sample distribution according to sociodemographic data (N = 130).

		F	%
Age	22 - 30 years	82	63.1
	31 - 40 years	39	30.0
	41 - 50 years	8	6.2
	50 over	1	.8
Gender	Male	66	50.8
	Female	64	49.2
Academic qualification	Diploma	20	15.4
	Bachelor	97	74.6
	Master	13	10.0
Place of Work	Jenin Governmental Hospital	40	30.8
	Ibn Sina Hospital	21	16.2
	Rafidia Hospital	35	26.9
	Al-Arabi Specialist Hospital	34	26.2
Years of Experience	5 years or less	75	57.7
	6 - 10 years	30	23.1
	11 - 15 years	17	13.1
	16 years or more	8	6.2

F: Frequency; %: Percent.

3.2. Knowledge and Attitude Regarding PrUs Preventive Measures

Table 2 shows that on the first axis which includes 5 points about etiology and development, the participants true responses ranged from (0 - 4) with a mean of (1.60) out of (5). On the second axis which includes 3 points about classification and observation, the participants true responses ranged from (0 - 3) with a mean of (1.04) out of (3). On the third axis which includes 2 points about risk management, the participants true responses ranged from (0 - 2) with a mean of (0.63) out of (2). On the fourth axis which includes 1 point about nutrition, the participants true responses ranged from (0 - 1) with a mean of (0.53) out of (1). On the fifth axis which includes 4 point about preventive measures to reduce the amount

of pressure, the participants true responses ranged from (0 - 4) with a mean of (1.74) out of (4). On the sixth axis which includes 3 points about preventive measures to reduce the duration of pressure, the participants true responses ranged from (0-3) with a mean of (1.36) out of (4).

On the total sum of knowledge which includes 18 points about knowledge regarding PrUs preventive measures, the participants true responses ranged from (1 - 12) with a total mean of (6.40) out of (18). This means that the level of nurse's knowledge regarding PrUs preventive measures at Palestinian Hospitals is low. The attitude dimension includes (13) statements and the responses ranged from (1 - 4) where strongly disagree = 1 point, disagree = 2 points, agree = 3 points, and strongly agree = 4 points. On the total sum attitude which includes 52 points about attitude regarding PrUs preventive measures, the participants true responses ranged from (26 - 47) with a total mean of (35.30) out of (52). This means that the level of nurse's attitude regarding PrUs preventive measures at Palestinian Hospitals is high.

Table 2. Means and standard deviation for the sample responses on the knowledge and attitude regarding PrUs preventive measures.

		N	Min	Max	Mean	SD
knowledge	Etiology and development (5 points)	130	0.00	4.00	1.61	1.07
	Classification and observation (3 points)	130	0.00	3.00	1.1	0.71
	Risk management (2 points)	130	0.00	2.00	0.64	0.71
	Nutrition (1 point)	130	0.00	1.00	0.53	0.50
	preventive measures to reduce the amount of pressure (4 points)	130	0.00	4.00	1.75	1.15
	preventive measures to reduce the duration of pressure (3 points)	130	0.00	3.00	1.37	0.77
	knowledge regarding PrUs preventive measures (18 points)	130	1.00	12.00	6.41	2.43
Attitude		130	26.00	47.00	35.30	4.75

N: sample size; Min: Minimum; Max: Maximum; SD: Standard Deviation.

3.3. Relationship between Knowledge and Attitude Regarding PrUs Preventive Measure among Nurses

Table 3 shows that the sig value is more than the significant level (0.05) which

Table 3. Correlation test for the relationship between knowledge and attitude regarding PrUs preventive measure among nurses.

Correlations	Knowledge	Attitude
Pearson Correlation	1	−0.0018
Sig. (2-tailed)		0.838
N	130	130

means that there is no significant relationship between knowledge and attitude regarding PrUs preventive measure among nurse's at the Palestinian Hospitals.

3.4. Knowledge and Attitude Regarding PrUs Preventive Measure Based on Demographic Data

The results presented in Table 4 provide insights into how demographic variables, such as gender, age, academic qualification, place of work, and years of experience, relate to nurses' knowledge and attitudes toward the studied subject.

Table 4. Relationship between knowledge and attitude regarding Demographic data.

Demographics data n = 130		Knowledge				Attitude		
		n	mean	SD	p-value	mean	SD	p-value
Gender	Male	66	5.84	2.22	0.001	36.33	5.17	0.01
	Female	64	6.98	2.50		34.23	4.03	
Age	22 - 30 y	82	6.40	2.47	0.47	34.56	4.53	0.08
	31 - 40 y	39	6.61	2.23		36.38	4.72	
	41 - 50 y	8	5.25	2.91		37.87	5.89	
	50 and over	1	8.00	undefined		33.00	undefined	
	Total	130	6.40	2.42		35.30	4.74	
Academic qualification	Diploma	20	6.80	2.23	0.03	37.10	4.32	.11
	Bachelor	97	6.22	2.37		34.81	4.75	
	Master	13	7.15	2.99		36.15	4.82	
	Total	130	6.40	2.42		35.30	4.74	
Place of work	Jenin Governmental Hospital	40	6.52	2.60	0.58	35.47	5.44	0.72
	Ibn Sina Hospital	21	5.80	2.42		34.90	4.62	
	Rafidia Hospital	35	6.71	2.56		35.91	4.65	
	Al-Arabi Specialist Hospital	34	6.32	2.08		34.70	4.10	
	Total	130	6.40	2.42		35.3000	4.74	
Years of experience	5 years or less	75	6.36	2.51	0.52	34.98	4.82	0.61
	6 - 10 years	30	6.03	2.23		35.23	4.45	
	11 - 15 years	17	6.94	2.04		35.94	4.30	
	16 years or more	8	7.12	3.04		37.12	6.19	
	Total	130	6.40	2.42		35.30	4.747	

Gender Differences

- **Knowledge**: Male nurses (mean = 5.84, SD = 2.22) reported significantly lower knowledge scores than female nurses (mean = 6.98, SD = 2.50), with a p-value

of 0.001, indicating a statistically significant difference.

- **Attitude**: Similarly, for attitude scores, males (mean = 36.33, SD = 5.17) had significantly higher scores than females (mean = 34.23, SD = 4.03), with a p-value of 0.01, also suggesting a significant difference. This result implies that while female nurses demonstrated higher knowledge levels, male nurses reported slightly more positive attitudes.

Age-Related Patterns

- **Knowledge**: Knowledge scores across age groups did not significantly differ, with a p-value of 0.47. Age group means ranged from 5.25 (41 - 50 years) to 8.00 (50 years and over), although the latter was based on a single participant.
- **Attitude**: Attitude scores appeared to increase with age, from a mean of 34.56 (22 - 30 years) to 37.87 (41 - 50 years), though this trend did not reach statistical significance (p = 0.08). The slight upward trend suggests that older nurses may hold more positive attitudes toward the subject matter.

Academic Qualification

- **Knowledge**: There was a statistically significant difference in knowledge scores based on academic qualification, with a p-value of 0.03. Nurses with Master's degrees scored the highest in knowledge (mean = 7.15, SD = 2.99), followed by Diploma holders (mean = 6.80, SD = 2.23) and Bachelor's degree holders (mean = 6.22, SD = 2.37). These findings suggest a positive correlation between higher educational levels and knowledge.
- **Attitude**: Although attitude scores varied across academic qualifications, with Master's degree holders reporting the highest mean attitude scores (mean = 36.15, SD = 4.82), this difference was not statistically significant (p = 0.11).

Place of Work

- **Knowledge**: Knowledge scores varied slightly by the hospital where nurses worked, though these differences were not statistically significant (p = 0.58). The highest mean knowledge score was among nurses from Rafidia Hospital (mean = 6.71, SD = 2.56), while Ibn Sina Hospital reported the lowest (mean = 5.80, SD = 2.42).
- **Attitude**: Attitude scores also showed little variance across hospitals, with Rafidia Hospital nurses again reporting slightly higher attitude scores (mean = 35.91, SD = 4.65), though differences were not significant (p = 0.72).

Years of Experience

- **Knowledge**: Knowledge scores demonstrated a slight increase with years of experience, with nurses having over 16 years of experience showing the highest mean knowledge score (mean = 7.12, SD = 3.04). However, this trend was not statistically significant (p = 0.52).
- **Attitude**: Attitude scores similarly increased with years of experience, with those having 16 or more years of experience scoring the highest (mean = 37.12, SD = 6.19). This difference was also not statistically significant (p = 0.61), although it suggests a possible trend where increased experience may correlate with more positive attitudes.

4. Discussion

This descriptive study aimed to define the knowledge and attitudes towards pressure ulcer preventive measures at Palestinian hospitals (Nablus and Jenin). Five hypotheses were set to test the level of knowledge, attitudes, correlations and differences among variables. The results showed a lack of knowledge and attitudes to prevent pressure ulcers. This suggests that there are no major differences between most hospital. A questionnaire was used to measure the level of nurse's knowledge and attitude regarding PrUs preventive measures at Palestinian hospitals.

Reviewing the literature, the majority of research mostly shows a lack of knowledge [23] [24] and attitudes towards the management of pressure ulcers among nurses as same as was revealed in this research. Few results showed satisfactory pressure ulcer knowledge and attitudes [23]-[25] among nursing staff. In our study, knowledge and attitudes correlated positively and were statistically significant. The same result was found in other studies [23] [24]. Nurses with higher education scored better in most studies [26], although a few older works showed no significance in education or years of nursing experience [27]. This study showed that nurse with a bachelor's degree scored less than nurses with secondary nursing education due to the changed system and content of nursing education in Slovakia in the late nineties. Reading articles by nurses about pressure ulcers prevention has no significant effect on their knowledge [25].

In this section of the research, the results revealed several findings. The researcher discusses these findings, attempts to compare them, and links them to theoretical frameworks and previous studies. The main findings of this research include that the level of nurse's knowledge regarding PrUs preventive measures at Palestinian hospitals is low and the level of nurse's attitude regarding PrUs preventive measures at Palestinian Hospitals is high.

This result is supported by Liu *et al.* study which showed lack of knowledge of pressure ulcer prevention among support workers across both acute and community settings in the UK, and found that the weakest areas of knowledge include a etiology, risk assessment and addressing pressure-reducing interventions for patients at risk, while the participants in the study showed positive attitude [28].

This result is also supported by Aydogan study where nurses were found to have a low level of knowledge but positive attitudes toward PU prevention [9]. This result is also supported by Jiang *et al.* study which showed insufficient pressure ulcer prevention knowledge among nurses who participated in the study, but it showed negative pressure ulcer prevention attitudes among the sample of nurses [29]. This result is also supported by Mahmoud *et al.* study which showed that most of the nurses had low knowledge for majority of items, but the same study also showed that all of nurses had negative attitudes regarding the prevention of pressure ulcer [30]. The results of our study also showed there is no significant relationship between knowledge and attitude regarding PrUs preventive measure among nurse's at the Palestinian Hospitals.

This result is not supported by Yilmazar *et al.* study which showed a significant

negative correlation existed between knowledge levels and attitudes of nurses to prevent pressure ulcer [24]. This result was also not supported by Tirgari *et al.* study where a statically significant relationship was observed between pressure injury knowledge & attitude toward pressure injury prevention [25]. Significant statistical differences in knowledge and attitude toward prevention of pressure ulcer were found among nurses attributed to gender. Females reported higher level of knowledge but males reported more positive attitude than females. Significant statistical differences in knowledge toward prevention of pressure ulcer were found among nurses attributed to academic qualification. But no significant statistical differences in attitude toward prevention of pressure ulcer among nurses attributed to academic qualification. The holders of Master degree have a higher level of knowledge toward prevention of pressure ulcer than other groups of academic qualification.

Pressure ulcers continue to be a major global health concern, as they are linked to serious consequences and elevated rates of death. These ulcers continue to be important markers of care quality, and the Palestinian healthcare system is managed to nursing care quality with insufficient advances in prevention. The frequency of pressure ulcers needs to be well-documented, and reporting practices may be weakened to preserve patient perceptions of high-quality care. This study casts doubt on the veracity of claimed incidence statistics by highlighting a worrying lack of awareness and attitudes regarding pressure ulcer prevention. Future initiatives should focus on the prevalence of pressure ulcers, the relevance and application of preventive measures, the knowledge and attitudes of healthcare workers, and the national education system regarding tissue viability and wound care. Finally, no significant statistical differences in knowledge toward prevention of pressure ulcer were found among nurses attributed to place of work or years of experience.

To strengthen the analysis and increase the study's overall impact, the discussion section may use some additional work. This section may be strengthened by offering a more comprehensive comparison with results from earlier studies, looking into potential reasons for the findings, and going into more depth about the consequences. Furthermore, providing more specific context by acknowledging limits and recommending topics for further study could be beneficial. This would not only make it clearer how this study adds to the body of knowledge already in existence, but it would also provide readers ideas for possible uses or additional research on the subject.

4.1. Conclusion

Despite favorable sentiments regarding the significance of pressure injury prevention, our survey shows a sizable knowledge gap in this area among nurses. The participants' desire for additional education and training emphasizes the necessity of formal educational initiatives in this crucial field. Leading their teams in pressure injury assessment and prevention is the responsibility of registered nurses.

Implementing focused training can improve understanding and incorporate prevention into regular activities, particularly for individuals providing direct patient care. To determine whether continuing training is beneficial and to make department heads aware of these knowledge gaps, more research is required.

4.2. Recommendations

The researchers have the following recommendations: The future researchers should conduct other research in the same field of this research and should increase the sample to generalize the results. Other samples from other hospitals in Palestine should be included in order to investigate the differences between them. Nursing administrators should explore strategies to improve training quality in order to increase their knowledge and attitude towards PrUs preventive measures in the future.

4.3. Limitations

Our results cannot be generalized due to the small sample. The small sample of respondents was a limitation. Another limitation is that the participants were from four Palestinian hospitals only. Other research on bigger samples that include other hospitals is needed.

Conflicts of Interest

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

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Appendix

Questionnaires

First: Demographic and Social Data:

1) Gender: Male ( ) Female ( )

2) The age group:

A. 22 - 30 years B. 30 - 40 years C. 40 - 50 years D. 50 and over

3) Academic Qualification:

A. Diploma B. Bachelor C. Master D. PhD

4) Place of work:

A. Jenin Governmental Hospital B. Ibn Sina Hospital

C. Rafidia Hospital D. Al-Arabi Specialist Hospital

5) Years of Experience:

A. 5 years or less B. 6 - 10 years C. 11 - 15 years D. 16 years or more

Second: To assess knowledge of pressure ulcers we use a tool PUKAT which includes:

***The first axis: etiology and development:**

1) What causes pressure ulcers?

A. Malnutrition B. Lack of oxygen C. Humidity D. I don't know

2) Extremely thin patients are more at risk of developing pressure ulcers than obese patients?

A. The contact area involved is small and therefore the amount of pressure is higher

B. The pressure is less extensive because the body weight of these patients is less than the body weight of obese patients

C. The risk of developing a vascular disorder is higher for obese patients. This increases the risk of developing a pressure ulcer

D. I don't know

3) Which statement is correct?

A. Soap can dehydrate skin and thus increase the risk of developing pressure ulcers

B. Moisture from urine, stool, or wound drainage causes pressure sores

C. Shear is the force that occurs when an body slides and the skin stick to the surface

D. I don't know

4) As a nurse, which of the following statements is more correct:

A. Recent weight loss which has brought a patient below his or her deal weight increases the risk of pressure ulcer

B. Very obese patients using medication that decreases the peripheral blood circulation are not at risk of developing pressure ulcers

C. Poor nutrition and age have no impact on tissue tolerance when the patient has a normal weight

D. I don't know

5) There is no relationship between the risk of pressure ulcers and:

A. Age B. Dehydration C. Hypertension D. I don't know

***The second axis: classification and observation:**

6) Based on the variety of degrees of pressure ulcers and their variation from one patient to another, which of the following statements is correct for you:

A. A blister on patient's heel is always a grade 2 of pressure ulcer

B. All grades (1, 2, 3, and 4) of pressure ulcers involve loss of skin layers

C. When necrosis occurs, it is a grade 3 or grade 4 pressure ulcer

D. I don't know

7) In a sitting position, pressure ulcers are more likely to develop on:

A. Pelvic area, elbow and heel area B. Knee, ankle and hip

C. Hip, shoulder and heel D. I don't know

8) Based on your experience as a nurse, which of the following is correct for patients with pressure ulcers:

A. All patients at risk of pressure ulcers should have a systematic skin inspection once a week

B. The skin of patients sitting on a chair, who cannot move themselves, should be inspected every 2 to 3 hours

C. The heels of patients who lie on a pressure redistribution surface should be observed at least a day

D. I don't know

***The third axis: risk assessment:**

9) Which of the following statements related to the risk assessment scales for patients with pressure ulcers is correct:

A. Risk assessment tools identify all high-risk patients in need of prevention

B. The use of risk assessment scales reduces the cost of prevention

C. The risk assessment scale may not accurately predict the risk of developing pressure ulcers and should be combined with clinical judgment

D. I don't know

10) According to your knowledge as a nurse about the risks of developing pressure ulcers, which of the following statements is correct:

A. The risk of developing pressure ulcers should be assessed daily in all nursing home patients

B. Absorbent pads should be placed under the patient to reduce the risk of developing pressure ulcers

C. A patient with a history of pressure ulcers is at greater risk of developing new pressure ulcers

D. I don't know

***The fourth axis: nutrition:**

11) Which of the following statements is correct and indicates the relationship between nutrition and pressure ulcers:

A. Malnutrition causes pressure ulcers

B. Use of nutritional supplements can replace expensive preventative measures
C. Optimizing nutrition can improve the general physical condition of patients, which may contribute to reducing the risk of developing pressure ulcers
D. I don't know

***The fifth axis: preventive measures to reduce the amount of pressure:**

12) The sitting position with the least contact pressure between the body and the seat is:

A. Upright sitting position, with both feet resting on the footrest
B. Upright sitting position, with both feet flat on the floor
C. Backwords sitting position, with both legs resting on the footrest
D. I don't know

13) Which of the following positions is more correct for patients with pressure ulcers:

A. Patients who are able to change their position while sitting should be taught to shift their weight minimum every 60 minutes while sitting in a chair
B. In the lateral position, the patient should be at an angle of 90 degrees with the bed
C. Shearing forces affect the patient's sacrum maximally when the head of the bed is positioned at 30 degrees
D. I don't know

14) If the patient is sliding down in a chair, the magnitude of pressure at the seat can be reduced the most by:

A. Thick air cushion
B. A sponge cushion in the shape of a donut
C. Gel cushion
D. I don't know

15) When the patient is lying on a pressure-reducing foam mattress:

A. Elevation of the heel is not necessary
B. Elevation of the heel is important
C. He/she should be checked for "bottoming out" at least twice a day
D. I don't know

***The sixth axis: preventive measures to reduce the duration of pressure:**

16) Repositioning is an accurate preventative method because:

A. The magnitude of pressure and shear will be reduced
B. The amount and duration of pressure and shear will be reduced
C. The duration of pressure and shear will be reduced
D. I don't know

17) When the patient is lying on an alternating air mattress, the prevention of heel pressure ulcer includes:

A. There are no specific preventive measures
B. A pressure reducing cuhsion under the heel
C. A cushion under the lower legs elevating the heel
D. I don't know

18) If a bedridden patient cannot be repositioned, the most appropriate prevention of pressure ulcers is:

A. A pressure redistributing foam mattress

B. An alternating pressure air mattress

C. Local treatment of risk areas with zinc oxide paste

D. I don't know

***The underline indicates the correct answer.**

Third: To measure the attitude of nurses towards pressure ulcers, we use the APUP tool:

	Strongly agree	Agree	Disagree	Strongly disagree
A. Personal competency to prevent pressure ulcers (three items) (maximum score = 12)				
1) I feel confident in my ability to prevent pressure ulcers.	○	○	○	○
2) I am well trained to prevent pressure ulcers.	○	○	○	○
3) Pressure ulcer prevention is too difficult. Others are better than I am.	○	○	○	○
B. Priority of pressure ulcer prevention (three items) (maximum score = 12)				
1) Too much attention goes to the prevention of pressure ulcers.	○	○	○	○
2) Pressure ulcer prevention is not that important.	○	○	○	○
3) Pressure ulcer prevention should be a priority.	○	○	○	○
C. Impact of pressure ulcers (three items) (maximum score = 12)				
1) A pressure ulcer almost never causes discomfort for a patient.	○	○	○	○
2) The financial impact of pressure ulcers on a patient should not be exaggerated.	○	○	○	○
3) The financial impact of pressure ulcers on society is high.	○	○	○	○
D. Responsibility in pressure ulcer prevention (two items) (maximum score = 8)				
1) I am not responsible if a pressure ulcer develops in my patients.	○	○	○	○
2) I have an important task in pressure ulcer prevention.	○	○	○	○
E. Confidence in the effectiveness of prevention (two items) (maximum score = 8)				
1) Pressure ulcers are preventable in high risk patients.	○	○	○	○
2) Pressure ulcers are almost never preventable.	○	○	○	○

List of Abbreviation

PU	Pressure Ulcer
APuP	Attitude towards Pressure Ulcer Prevention
PUKAT	Pressure Ulcer Knowledge Assessment Tool
ICU	Intensive Care Unit
QoL	Quality of Life
CCNs	Critical Care Nurses
NPIAP	National Pressure Injury Advisory Panel
IRB	Institution Review Board
PI	Pressure Injury
NHS	National Health Service
N	Sample Size
Min	Minimum
Max	Maximum
SD	Standard Deviation