
| RESEARCH ARTICLE

Nurse's Knowledge Regarding Pressure Ulcer Prevention among Critical Patients in Intensive Care Unit at Governmental Hospitals in Gaza Strip

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| ABSTRACT

This study aimed to assess nurse's knowledge of pressure ulcer prevention in governmental hospitals in the Gaza Strip. This study utilized a descriptive, cross-sectional, analytical design. The sample of the study consisted of 116 ICU nurses from five governmental hospitals. For data collection, the researcher used a self-administrated questionnaire and Observation Checklist. Results showed that the study population were males (73.3%) and 26.7% were females. Moreover, (62.1%) of the study population had less than 5 years of experience in the ICU. There were no statistical significant differences between means in knowledge related to gender, age, educational level, and hospitals. The study concluded that intensive care nurses' knowledge of pressure ulcer prevention was above moderate. The study recommended the need to provide sufficient numbers of qualified nurses in intensive care departments and urged nurses to attend training courses on safety standards for the prevention of pressure ulcers among patients.

| KEYWORDS

Pressure Ulcer, Nurses, Knowledge, Prevention

| ARTICLE INFORMATION

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1. Introduction

Patient safety is essential for the delivery of effective, high-quality healthcare. One of the most vital forms of affected patient safety is pressure ulcers (PUs), which can be a critical health problem that every day impacts sufferers and healthcare structures (Kottner et al., 2019). Pressure ulcers have received international recognition as a preventable patient safety issue, and healthcare facilities all around the world use them as a standard for the quality of the nursing staff (Vrachni et al.,2022).

Pressure ulcers are a type of injury that breaks down the skin and underlying tissue when an area of skin is placed under constant pressure for certain periods causing tissue ischemia, cessation of nutrition and oxygen supply to the tissues and eventually tissue necrosis (Khojastehfar et al.,2020). A localized disintegration of soft tissue brought on by compression between a bony prominence and an external surface is what leads to Pressure ulcers (Etafa et al., 2018). A patient who has a pressure ulcer experiences pain and discomfort as well as the possibility of a protracted sickness, delayed recovery, an extended hospital stay, disability, and even death due to the ulcer and its complications. (Englebright et al.,2018). A significant burden is imposed on patients, their family members, and caregivers due to Pressure ulcers, which is a prevalent illness among hospitalized patients in acute and chronic care settings (Kirkland et al., 2018).

Critical care patients, in particular, tend to be at a higher risk of developing Pressure ulcers (Gunningberg et al.,2017). Due to the severity of the illnesses and treatments, PU prevention in the intensive care population continues to be a significant problem in many hospitals. (Niyongabo et al., 2022). Critically ill patients are given life-saving care in intensive care units (ICUs), but these

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facilities come with a high risk of major errors and adverse outcomes due to the numerous interactions that take place between patients and multidisciplinary healthcare professionals (Choi et al., 2016).

Critical care nurses play a crucial role in providing high-quality care in the intensive care unit (ICU), which needs a positive attitude, sufficient knowledge, and the ability to implement Pressure ulcer protective measures that enhance patient outcomes (Galvão et al., 2017). Most hospital acquired pressure ulcers (HAPUs) are considered preventable and are identified by the National Quality Forum as a nurse-sensitive quality indicator (Smith, 2018). Quality of critical nursing care requires assessment and evaluation of pressure ulcers. (Garrigues et al., 2017). There are two types of risk factors that affect on developing Pressure ulcer include internal and external factors (Soban et al., 2017). Internal risk factors such as immobility, body type, inadequate nourishment, diminished sensibility, advanced age, moisture problems, infection and circulatory problems (Whitty et al., 2017). While external risk factors include excessive pressure, friction impact injury, heat, moisture and posture (Ocampo et al., 2017).

The burden of Pressure ulcers is considered to be predictable and preventable through risk assessment combined with preventive action (Gul et al., 2017). Critical-care patients are a highly specialized problem, and the risk of pressure injuries in this population is probably different from the risk in other populations. Therefore this study was conducted to assess Critical Care nurses' knowledge regarding Pressure ulcer prevention among critical patients at intensive care units in governmental Gaza Hospitals.

Every healthcare system had to deal with the huge financial burden of pressure ulcers, which had a negative impact on patient outcomes (Aslan & Yavuz, 2016). For some residents, they lead to discomfort, suffering, lower quality of life, and even death (Nowick et al., 2018). They represent more patients being admitted to the hospital, more staff time, and more medical resources being used to treat an illness that could be avoided (Fletcher, 2017). Numerous studies have shown that nurses' understanding, beliefs, and practices regarding the prevention of pressure ulcers are insufficient (Al Shidi, 2016).

Moreover, from researcher experience in ICUs in the Gaza Strip, Palestine, it was observed that there is a lack of knowledge regarding risk factors of pressure ulcer development and skills among critical care nurses regarding bed care, repositioning of critical patient and how to prevent bed pressure ulcer through the application of safety practice and effective strategies for hospital acquired pressure ulcer prevention, which finally influence on the quality of critical care. Besides that, there are no empirical studies regarding critical care nurses' knowledge regarding pressure ulcer prevention implemented at governmental hospitals in the Gaza Strip. Therefore, the present study aimed to assess nurses' knowledge regarding pressure ulcer prevention among critically patients in intensive care unit at governmental Gaza Hospitals.

2. Methods and materials

2.1 Design, sample, and setting

The present study adopted a cross-sectional design. The study population consisted of all the critical care nurses who are working in ICUs at governmental hospitals in Gaza Strip. A census sample was used, which includes all the critical care nurses who are working in ICUs (N=116). It was conducted in ICUs at all governmental hospitals in Gaza Strip. The study was conducted during the period from Mar 2022 to July 2022.

2.2 Eligibility of Criteria and Instrument

Critical care nurses who are working in ICU were included in the present study, while nurses who had vacation during the period of study while those who were working in the ICU for a period of less than 6 months were excluded. A self-administrated questionnaire was distributed to critical care nurses. The questionnaire item scoring was: (3) correct, (2) Incorrect, (1) I Don't Know. A practical checklist was used for monitoring critical care nurse's practice, scoring : (5-Always, 4-Often, 3-sometimes, 2-Rarely, and 1-Never). The questionnaire was reviewed by the experts to evaluate the procedure of questions and the method of analyzing the results. The experts agreed that the questionnaire was valid and suitable enough to measure the purpose that the questionnaire was designed for.

The reliability of an instrument was measured using Cronbach's Alpha for each questionnaire domain of participants. The table illustrated the reliability of domains; values of Cronbach's Alpha were in the range of 0.728 and 0.920. Cronbach's alpha equals 0.942 for the entire questionnaire in the pilot sample, which indicates good reliability of the entire questionnaire, which gives the researcher the power to apply it to the study sample.

2.3 Data analysis

Data was entered using (SPSS) version 28. Data cleaning was performed. Statistical analysis included frequencies, percentages, means, and SD. Moreover, One way ANOVA and t-test were used.

2.4 Ethical and administrative considerations

An official letter was obtained from the Islamic University of Gaza. In addition, an approval letter was obtained from Helsinki Committee. The consent form was attached to the questionnaires; participants have the right to refuse to participate or withdraw from the study at any time.

3. Results

The present study included 116 participants. Socio-demographic characteristics included a hospital, gender, qualification, age, experience in ICU, monthly income, shift worked, attendance training courses about pressure ulcer prevention, and the workplace has a written policy for pressure ulcer prevention.

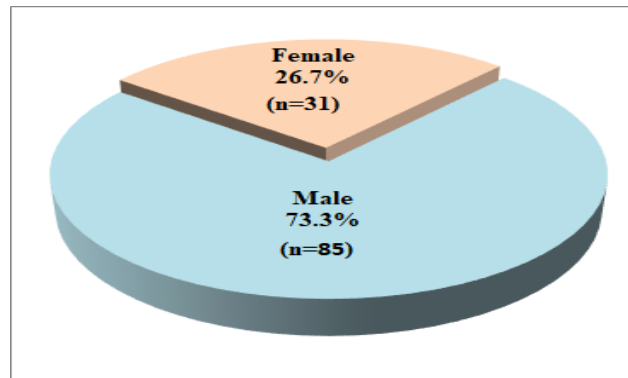


Figure 1: Distribution of the study population according to their gender

Figure 1 showed that more than half of the study population were males (73.3%) while 26.7% were females.

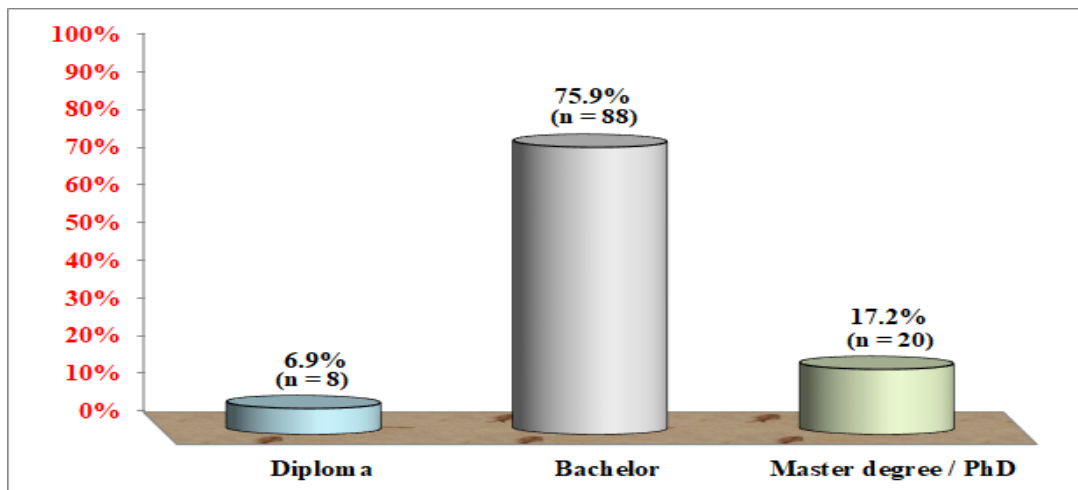


Figure 2: Distribution of study population according to their Qualification

Figure 2 shows that the highest group of the study population has finished their bachelor's degree (75.9%), while 17.2% of them finished their master's degree / PhD and 6.9% finished their diploma degree. Table 1 showed that (25.9%) of the study population was from the European Gaza Hospital and the same average of (25.9%) was from Al-Shifa Medical Complex, while (13.8%) was from Al-Aqsa Martyrs Hospital and the same average (13.8%) were from the Indonesian hospital, and finally (20.7%) were from Nasser Hospital. Moreover, the table illustrated that more than half of the study population (62.1%) had less than 5 years of experience in ICU, while (25.0%) of them had between 5-10 years of experience in ICU and (12.9%) of them had more than 10 years of experience in ICU.

Also, findings showed that most of the study population (70.7%) earn about 1800-2000 NIS per month, while (19.8%) of them earn less than 1800 NIS per month, and only (9.5%) of them earn more than 2000 NIS per month. Regarding the shifts worked, the table showed that most of the study population (84.5%) had mixed shifts, while (12.1%) of them had straight morning shifts and only (3.4%) of them had night shifts. The table also illustrated that only (30.4%) attended training courses about PU prevention, and 69.6% of the study population did not attend any training courses about pressure ulcer prevention. Moreover, the table showed that (38.8%) of them do not have any written policy for pressure ulcer prevention in their workplace, and (61.2%) of the study population's workplaces have a written policy for pressure ulcer prevention.

Table 1: Distribution of the study population according to their socio-demographic information

Demographic data		n	%
Hospital	Al Shifa	30	25.9%
	Indonesy	16	13.8%
	Al-Aqsa Martyrs	16	13.8%
	Nasser	24	20.6%
	European Gaza Hospital	30	25.9%
Experience in ICU	Less than 5 years	72	62.1%
	5-10	29	25.0%
	more than 10	15	12.9%
Monthly Income (NIS)	Less than 1800	23	19.8%
	1800-2000	82	70.7%
	More than 2000	11	9.5%
Shift worked	Straight Morning	14	12.1%
	Evening	0	0.0%
	Night	4	3.4%
	Mixed	98	84.5%
Attend a training course about PU prevention?	No	80	69.6%
	Yes	35	30.4%
Did your workplace have a written policy for PUprevention?	No	45	38.8%
	Yes	71	61.2%

Furthermore, regarding these findings of the study that distribution of their experience groups was incongruent with the previous study that was conducted by Ünver et al. (2017), they found that a total of (54.5%) were working in surgical wards and (40.6%) gained additional education about pressure ulcer care and (59.4%) of them were not received the previous education about pressure ulcer care.

Table 2 shows the distribution of the participants according to their responses to their knowledge; the total knowledge of risk assessment score is 73.9%. The table showed that the highest correct answer item the number (1) Skin assessment from Head to toe is an assessment procedure for all patients who is at high risk for pressure ulcer development (95.7%), followed by paragraph (2) Partial skin loss with blister & abrasion is the sign of stage II pressure ulcer (81.9%) and paragraph (3) Pale, red, or blue-gray discoloration on the skin is the late sign for pressure ulcer development (44%).

The total knowledge of Skin care is 78.7%. The table showed that the highest correct answer item was number (4) Using a pillow under the patient's leg is helpful to prevent heel ulcer (94.8%), followed by items number (2) Changing position every 2 hours is not the significant activity for protecting skin damage (87.1%), items number (1) Topical cream is an appropriate method for skin care (80.2%), items number (3) Cleansing by using skin cream or lotion is appropriate for preventing maceration (52.6%).

The results showed that the total knowledge of nutrition status is 74.1%; the table showed that the highest correct answer item was the number (2) High protein and high calorie needs to be offered to an old bedridden patient who has BMI < 18.5 (84.5%), Followed by items number (1) Nutrition that supplied with Vitamin C & E are important to maintaining healthy skin (75%), and items number (3) Serum albumin is an inappropriate lab test for nutritional assessment of pressure ulcer patient (62.9%).

The table showed that the total knowledge of repositioning of the patient (75.4%), The table showed that the highest correct answer item was the number (1) Changing position is not appropriate nursing care for preventing pressure ulcer formation (87.9%), followed by items number (4) Schedule of Changing position is not necessary for reducing pressure ulcer formation (83.6%), items

number (2) Lift patient without dragging is an appropriate activity to reduce friction and pressure ulcer formation (75%), items number (3) Elevate the head of the bed < 300 is the activity for reducing compression force on patient back (55.2%).

The table showed that the total knowledge of Factors related to pressure ulcer development is 74.8%; the table showed that the highest correct answer item was the number (2) Immobility is considered an important factor for pressure ulcer formation, followed by items number (93.1%), items number (1) High loading pressure for a long period isn't a contributing factor for pressure ulcer formation (87.1%), items number (3) Feces is the favorable environment for preventing bacterial growth in the form of maceration (75%), items number (4) High albumin is the critical determinant for pressure ulcer formation (44%).

Table 2: Scores of items measuring knowledge

Items	Key Answer	Correct (n)	%	Incorrect (n)	Rank
Risk assessment		73.9		26.1	
1 Skin assessment from Head to toe is an assessment procedure for all patients who is at high risk for pressure ulcer development	Correct	111 (95.7%)	95.7	5 (4.3%)	1
2 Partial skin loss with blister & abrasion is a sign of stage II pressure ulcer	Correct	95 (81.9%)	81.9	21 (18.1%)	2
3 Pale, red, or blue-gray discoloration on the skin is a late sign of pressure ulcer development	Incorrect	51 (44%)	44	65 (56%)	3
Skincare		78.7		21.3	
1 Topical cream is an appropriate method for skin care	Correct	93 (80.2%)	80.2	23 (19.8%)	3
2 Changing position every 2 hours is not a significant activity for protecting skin damage	Incorrect	101 (87.1%)	87.1	15 (12.9%)	2
3 Cleansing by using skin cream or lotion is appropriate for preventing maceration	Incorrect	61 (52.6%)	52.6	55 (47.4%)	4
4 Using a pillow under the patient's leg is helpful in preventing heel ulcers	Correct	110 (94.8%)	94.8	6 (5.2%)	1
Nutrition Status		74.1		25.9	
1 Nutrition that is supplied with Vitamin C & E is important to maintain healthy skin	Correct	87 (75%)	75	29 (25%)	2
2 High protein and high calorie needs to be offered to an old bedridden patient who has BMI < 18.5	Correct	98 (84.5%)	84.5	18 (15.5%)	1
3 Serum albumin is an inappropriate lab test for nutritional assessment of pressure ulcer patients	Incorrect	73 (62.9%)	62.9	43 (37.1%)	3
Repositioning of patient		75.4		24.6	
1 Changing position is not appropriate nursing care for preventing pressure ulcer formation	Incorrect	102 (87.9%)	87.9	14 (12.1%)	1
2 Lift patient without dragging is an appropriate activity to reduce friction and pressure ulcer formation	Correct	87 (75%)	75	29 (25%)	3
3 Elevating the head of the bed < 300 is the activity for reducing compression force on the patient back	Correct	64 (55.2%)	55.2	52 (44.8%)	4

Items	Key Answer	Correct (n)	%	Incorrect (n)	Rank
4 Schedule of changing position is not necessary for reducing pressure ulcer formation	Incorrect	97 (83.6%)	83.6	19 (16.4%)	2
Factors related to pressure ulcer development		77.45		25.2	
1 High loading pressure for a long period isn't a contributing factor to pressure ulcer formation	Incorrect	101 (87.1%)	87.10	15 (12.9%)	2
2 Immobility is considered an important factor for pressure ulcer formation	Correct	108 (93.1%)	93.10	8 (6.9%)	1
3 Feces is a favorable environment for preventing bacterial growth in the form of maceration	Incorrect	87 (75%)	75.00	29 (25%)	3
4. High albumin is the critical determinant for pressure ulcer formation.	Incorrect	51 (44%)	44.00	65 (56%)	4

Table 3 illustrates the distribution of the study population according to their responses about knowledge. 39.7% of the participants have a high knowledge level while 50.0% of them have moderate levels of knowledge, and 10.3% of them have a low level of knowledge. Finally, the average (SD) of knowledge levels was 75.53 (13.51).

Table 3: Distribution of the study population according to their level of knowledge

Variable and level	n	%	Mean ^f	SD	Min	Max
Total knowledge levels			75.53	13.51	27.78	100.00
High	46	39.7	88.16	4.77	83.33	100.00
Moderate	58	50.0	71.07	5.86	61.11	77.78
Low	12	10.3	48.61	8.58	27.78	55.56

n: number of subjects; **SD**: standard deviation; **Min**: minimum; **Max**: maximum; ^fMaximum score of mean = **100 points**; **High**= equal 80% or more; **Moderate** = 60-79.9%; **Low** = less than 60%.

Table 4 shows the mean difference in knowledge domains related to gender. The results showed that there is no statistically significant difference between means of knowledge among males and females ($P > 0.05$). The one-way ANOVA test showed there is no statistically significant difference between means of knowledge related to educational levels ($P > 0.05$). The one-way ANOVA test also showed there is no statistically significant difference between means of knowledge domains related to the hospitals as a nurse ($P > 0.05$). Moreover, the one-way ANOVA test showed there is no statistically significant difference between means in knowledge related to the age groups ($P > 0.05$).

Table 4: Mean difference of knowledge domains related to the gender

Domains	Categories	N	Mean	SD	t/f	P-value
Knowledge (%)	Male	85	76.93	13.70	1.870	0.064
	Female	31	71.68	12.37		
Knowledge (%)	Diploma	8	80.56	7.86	0.752	0.474
	Bachelor	88	75.5	13.33		
	Master's degree / PhD	20	73.61	15.9		
Knowledge (%)	Al Shifa	30	70.37	14.83	1.673	0.161
	Indonesy	16	78.82	12.54		
	Shohada Al Aqsa	16	78.82	13.94		
	Nasser	24	76.16	12.85		
	EuropeanGaza Hospital	30	76.67	12.24		

*Significant at $P \leq 0.05$; $P > 0.05$: Not significant; **n**: number of subjects; **SD**: standard deviation; **t**: Independent Sample t test & **F**: One way ANOVA.

4. Discussion

According to study findings were incongruent with a previous study that was conducted by Li Hu et al. (2021); they found the lowest score was on the theme of "etiology, factors related to pressure ulcer development " with an average score of 50.90 ± 15.26 , followed by those of "risk assessment" (58.82 ± 32.12), then the "nutrition for pressure ulcers prevention was (61.11 ± 20.41), "prevention of pressure ulcers" was (68.86 ± 16.32), and "classification and observation" were (72.25 ± 20.73). Overall, only (5.1%) of participants showed they have sufficient pressure ulcer prevention knowledge. In addition, only 32.5% of respondents knew that a patient with a history of PUs has a higher risk of developing new pressure ulcers, while 39.4% stated that the risk of pressure ulcer development should be assessed daily in all -patients. Finally, immobility, skin moisture, dual incontinence, diabetes, sensory perception, nutrition, and albumin were shown to increase the risk of pressure ulcers.

In total, the study findings were incongruent with a previous study that was conducted by Sen (2020), in which the mean knowledge score of the nurses was calculated to be $9.57 +_3.27$ and the level of knowledge was good in (8.3%) and fair in (11.1%), while the poor level in (80.6%) participants. According to these study findings of their level of knowledge was incongruent with a previous study that was conducted by Li et al. (2021); they found the results implied that ICU nurses' knowledge of pressure ulcers prevention was inadequate, with a mean score of 65.82, this study that (58.3%) of them had adequate pressure ulcers prevention knowledge. The total results of knowledge level in this current study were incongruent with a previous study that was conducted by Tshiamo study in (2020), that he was indicated a severe knowledge deficit on pressure ulcer prevention among the nurses, as less than half of nurses' was (46.1%) had knowledge of pressure ulcer prevention.

Interestingly, this result was consistent with other previous studies that were conducted by Sham, Sharif, Moxsin and Selamat (2020); they found in this previous study that the association between knowledge of pressure ulcer prevention with the gender characteristic of the nurses showed no significant association. Similar to the result of other previous studies that were consistent with the association finding that was conducted by Sen (2020), they found there was not a significant association between knowledge and practice with demographic variables in gender.

Regarding education, this result was consistent with another previous study conducted by Sham et al. (2020), which found that the association between knowledge of pressure ulcer prevention with their qualification characteristic of the nurses showed no significant association ($p=0.25$). Moreover, this result was inconsistent with another previous study that was conducted by Tesfa et al. (2021); they found it statistically associated with pressure ulcer prevention knowledge of nurses with advanced educational levels. Also, they found a statistically significant between their qualification levels and pressure ulcer prevention practices.

Regarding the working area, the present study result was consistent with another previous study that was conducted by Sham et al. (2020); they found no significant association between knowledge of pressure ulcer prevention with their place of work

characteristics of the nurses. In addition, they found there was no association between the nurses' knowledge with other demographic characteristics. Moreover, these findings were incongruent with the result of a previous study that was conducted by Sawant and Shinde (2017); they found there was a significant association between the knowledge of nurses with their age groups ($p=.000$) as $\{p < 0.05\}$.

5. Conclusion

Regular assessment should be done for the competency of nurses in PU prevention. The most recent PU guidelines should be made accessible to nurses. Training programs on PU prevention should be given to nurses. Support each shift with skilled nurses to reduce the workload. Nurses in ICU should be engaged in-service training programs that improve their knowledge and practices of PUs prevention. Nurses should also take responsibility for compliance with updated guidelines for the practice of PU prevention. Close supervision and preceptor-ship of new nurses to improve their skills and competence in PU prevention should be done. Further research should be carried out to determine if there are any differences in the nurses employed at different hospitals.

5.1 Limitations of the Study

Limited availability of publications regarding pressure ulcers in Palestine. Participants were overworked during data gathering, which limited their availability of them.

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Conflicts of Interest: The authors declare no conflict of interest.

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