



## Research Article

## Protective Health Behaviors among Critical Care Nurses Concerning Pressure Ulcer Prevention for Hospitalized Patients at Baghdad Teaching Hospitals

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## Abstract

**Background:** Pressure ulcers remain a serious complication for immobile patients and a burden for healthcare professionals. **Objectives:** To assess health behavior prevention among critical care nurses regarding pressure ulcer prevention for hospitalized patients and to find out the relationship between critical care nurses health behavior prevention and sociodemographic variables. **Methods:** A cross-sectional design study was carried out in critical care units at three teaching hospitals. The study period extended from November 1, 2022, to January 28, 2023. Non-probability purposive sampling, whose target population was 100 nurses who work in critical care units in Baghdad city, Iraq. Data were collected using a self-administered questionnaire. The data was collected from November 10th through December 23rd, 2022. Study instruments consist of two parts. First, the demographic sheet included sociodemographic information about the participants. The second part includes nurses' attitudes toward the pressure ulcer prevention instrument (APuP). The collected data was analyzed using SPSS version 26. **Results:** Findings of the current study showed nearly three-quarters (74%) of critical care nurses had positive health behaviors regarding pressure ulcer prevention based on a total mean score of 2.26. **Conclusion:** This study concluded that the critical care units' nurses surveyed in this study demonstrate an acceptable level regarding pressure ulcer prevention and treatment. Continuing education or in-service training should be provided to enhance critical care units' nurses' practices and positive health behaviors about pressure ulcer prevention.

**Keywords:** Hospitalized patients, Protective health behaviors, Pressure ulcer, Prevention.

السلوكيات الصحية الوقائية لدى ممرضى الرعاية الحرجة فيما يتعلق بالوقاية من قرحة الضغط للمرضى الراقدين في مستشفيات بغداد التعليمية  
الخلاصة

**الخلفية:** تبقى قرحة الضغط من المضاعفات الخطيرة للمرضى غير القادرين على الحركة وعبئا على المتخصصين في الرعاية الصحية. **الأهداف:** تقييم الوقاية السلوكية الصحية بين ممرضى الرعاية الحرجة فيما يتعلق بالوقاية من قرحة الضغط للمرضى الراقدين في المستشفى ومعرفة العلاقة بين الوقاية والسلوك الصحي لممرضى الرعاية الحرجة والمتغيرات الاجتماعية الديموغرافية. **الطريقة:** تم إجراء دراسة مقطعية في وحدات العناية المركزة في ثلاثة مستشفيات تعليمية. وامتدت فترة الدراسة من 1 نوفمبر 2022 إلى 28 يناير 2023. تم أخذ العينات غير الاحتمالية، وكان عدد المستهدفين 100 ممرض وممرضة يعملون في وحدات الرعاية الحرجة في مدينة بغداد، العراق. تم جمع البيانات باستخدام استبيان يتم إجراؤه ذاتيا. تم جمع البيانات من 10 نوفمبر حتى 23 ديسمبر 2022. تتكون أدوات الدراسة من جزأين. أولاً، تضمنت معلومات اجتماعية وديموغرافية عن المشاركين. يتضمن الجزء الثاني مواقف الممرضين تجاه أداة الوقاية من قرحة الضغط وتم تحليل البيانات التي تم جمعها باستخدام SPSS الإصدار 26. **النتائج:** أظهرت نتائج الدراسة الحالية أن ما يقرب من ثلاثة أرباع (74%) ممرضى الرعاية الحرجة لديهم سلوكيات صحية إيجابية فيما يتعلق بالوقاية من قرحة الضغط بناء على متوسط إجمالي قدره 2.26. **الاستنتاج:** خلصت هذه الدراسة إلى أن ممرضى وحدات العناية المركزة الذين شملهم الاستطلاع لديهم مستوى مقبول فيما يتعلق بالوقاية من قرحة الضغط وعلاجها. يجب توفير التعليم المستمر أو التدريب أثناء الخدمة لتعزيز ممارسات ممرضى وحدات الرعاية الحرجة والسلوكيات الصحية الإيجابية حول الوقاية من قرحة الضغط وعلاجها.

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## INTRODUCTION

Pressure ulcers (PU) are one of the most common hospital-acquired problems. They happen most often in people who can't move around easily, like people with spinal cord injuries, people who are too old or too young, people who aren't getting enough food, people who are too sick to move around (like people in intensive care units), and people who smoke, have diabetes, or have vascular disease. It is also described as localized tissue damage of the skin or soft tissue covering the bony prominence. Every year, 2.5 million people in the United States are prone to developing pressure ulcers, among which 60,000 will die due to their complications, such as sepsis and osteomyelitis. Pressure ulcers can also have adverse effects on families and care providers in health organizations, impose therapeutic costs on the family and medical centers, and lower quality of life [2]. Pressure ulcers are a painful burden for patients and clients of all ages, which causes complications such as comfort, pain, quality of life, costs, and a long stay in hospitals [3]. Nurses have a great position to advance best practices towards the prevention of PU. Therefore, they need to be knowledgeable about the signs and symptoms of pressure ulcers and preventive strategies to reduce their incidence [4]. Nurses, in particular, can play a key role in the evaluation of PU risk factors. When patients are hospitalized for long-term care, caregivers monitor the area prone to damage to detect a preventive early stage and then carry out preventive care [5]. The prevalence of bed sores decreased if the patient was assessed for the risk of a pressure ulcer upon admission and if a regular assessment was followed by appropriate action or intervention. Providing sufficient education, fostering positive behavior, and addressing barriers are all important aspects of improving the knowledge and use of pressure ulcer preventive measures among nursing staff [6]. Increasing understanding of nurses' health behaviors in different health care settings using accurate assessment is crucial to further developing PU prevention practices and training interventions. In addition, understanding the factors related to health behavior prevention through PU prevention interventions is essential to improving prevention practices [7]. Patients residing in the intensive care unit (ICU) are extremely prone to developing pressure injuries. Data from 13,254 patients in 1117 ICUs (90 countries) revealed 6747 pressure injuries; 59.2% were ICU-acquired. The incidence of bed sores that affect hospitalized patients varies by country, with an estimated 14%–17% in the United States, 18.1% in European countries, and 19% in Iran [8]. However, very few studies in Iraq are available regarding the attitude of nurses towards pressure ulcer prevention. Based on how nurses' behaviors can affect the way they deliver care to patients with pressure ulcers and the few studies in this area as well, the current study was designed and carried out to identify the level of protective health behaviors

among nurses concerning pressure ulcer prevention for hospitalized patients.

## METHODS

### *Study design*

This descriptive cross-sectional study design was performed to explore the level of health behavior prevention among critical care nurses regarding pressure ulcer prevention for hospitalized patients.

### *Setting and period*

The study was conducted among nurses who work in eight adult critical care units of a tertiary teaching hospital in Baghdad city between November 1, 2022, and January 28, 2023. Intensive care units have a total of 75 beds, and the total number of nurses working in eight critical care units was 133.

### *Study Participant*

The study population was all CCU staff nurses who were available during data collection time and worked in adult intensive care units for more than 6 months in teaching hospitals in Baghdad, Iraq.

### *Inclusion and exclusion criteria*

All permanent staff nurses working at the selected hospitals included 8 critical care units. The inclusion criteria were being nurses working in the selected CCUs for at least 6 months, caring for critically ill patients who suffered from PUs, and being available during the study period. Exclusion criteria: staff nurses who were not cooperating to fill out the administered questionnaire were excluded. Staff nurses who are critically ill during data collection.

### *Sampling and sample size*

Non-probability purposive sampling was used to include 100 CCU nurses from three teaching hospitals in Baghdad city. The sample size was determined by using a single population proportion formula and considering the following assumptions: = total population (nurses) = 133, 95% confidence, 5% error  $5/100=0.05$ , If  $N = 133$ ,  $n = \text{sample size}$   $E = \text{margin of error}$   $n = N / [1 + (N) (E)^2]$   $n = 133 / [1+133 (0.05)^2]$ ,  $n = 133 / [1+133 (0.0025)]$ ,  $n = 133 / [1+0.3325]$ ,  $n = 133 / 1.3325$   $n = 99.8=100$  [9]. Rao software had been used with a set confidence interval of 5% and a confidence level of 95% to determine the sample size.

### *Study instruments and data collection*

Data were collected using a self-administered questionnaire. The data was collected from November 10th through December 23rd, 2022. Study instruments consist of two parts. The pressure ulcer prevention instrument (APuP), which was developed and validated, is the subject of Part 1 of the nurse information tool, which consists of six questions about the demographic characteristics of the nurse. The investigator modified the scale, added the necessary items, translated and retranslated it from the original English version to Arabic, and used the final validated instruments for this research work [10]. The attitudes of respondents toward pressure ulcer management were assessed by the APuP measurement tool. The 15-item instrument was divided into 5 domains: (1) personal competency to prevent pressure ulcers; (2) impact of pressure ulcer prevention; (3) impact of pressure ulcers; (4) responsibility of pressure ulcer prevention; and (5) confidence in the effectiveness of prevention. Opinions were possible to express on a Likert-type scale (3 = strongly agree, 2 = agree, and 1 = strongly disagree). The total score ranges from 15 to 45; higher scores indicate more positive health behaviors toward PU prevention. We translated these scores into percentage scores and categorized them into two levels:  $\geq 75$  indicated satisfactory positive health behaviors, while  $s < 75$  indicated unsatisfactory positive health behaviors. The cut-off point is calculated according to the following: The considered cut-off point for assessing the positive health behaviors of the studied sample is therefore the levels of positive health behaviors as follows: 1-2 represents unsatisfactory positive health behaviors, and 2.1-3.0 represents satisfactory positive health behaviors.

### Ethical considerations

The ethical permission (Ethics Committee Permission Number: 20/10/2022-2105) came from the relevant University of Baghdad, College of Nursing, Clinical Research Ethics Committee, institutional permission from the Faculty of Nursing, and from the selected hospitals' ethical boards before data collection began. Participation was completely voluntary, with written informed consent from nurses, who were assured that their responses would be confidential.

### Statistical analysis

Descriptive and inferential statistical procedures were conducted. The descriptive analysis was presented with frequency, percentage, and mean and standard deviation. The Chi square test was employed to determine the association between positive health behaviors and certain demographic characteristics. Statistically significant when the  $p$ -value is  $< 0.05$ . All the data were analyzed with SPSS Statistics (version 26).

## RESULTS

In Table 1, the study's findings revealed that males made up the majority of study participants (70%), while females made up the remaining 30%. The average age of the participants was  $27.9 \pm 6.405$ , with a minimum age of 18 and a maximum age of 50. The majority of the study participants (38%) were between the ages of 28 and 37, and 48 percent of the nurses had a bachelor's degree.

**Table 1:** Distribution of the participants according to the socio-demographical characteristics variables ( $n=100$ )

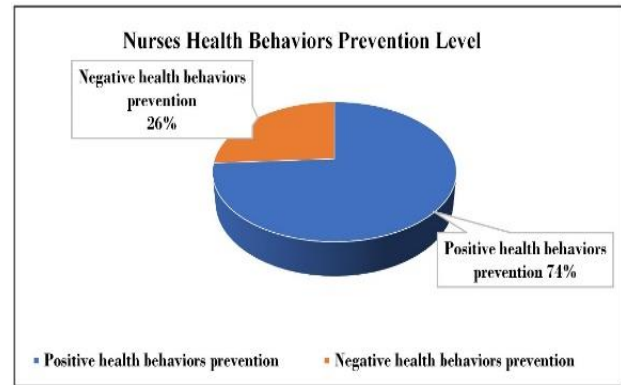
Variables	Groups	Frequency n(%)
Gender	Male	70(70)
	Female	30(30)
Age (Groups) Years	18-27	28(28)
	28-37	38(38)
	38-47	25(25)
	48 and above	9(9)
	Nursing school	12(12)
Educational level	Diploma	34(34)
	College	48(48)
	MSc PhD	6(6)
Marital Status	Single	46(46)
	Married	50(50)
	Divorced	2(2)
	Widow	2(2)
Years of employment in nursing	$\leq$ One year	18(18)
	1-5 years	63(63)
	6-10 years	10(10)
	11-15 years	5(5)
	16-20 years	4(4)
	$\leq$ One year	21(21)
Nurses experience in ward	1-5 years	60(60)
	6-10 years	10(10)
	11-15 years	9(9)
Training course	16-20 years	0(0.0)
	Yes	56(56)
	No	44(44)

Half of the nurses were married, while the rest were single. Two-thirds of them (63%) had experience in a hospital from 1 to 5 years, and more than half of them had worked in a critical care unit from 1 to 5 years. Finally, the majority of nurses (56%) had attended a pressure ulcer prevention training session. The study results indicated that approximately three-quarters of study participants (74%), with a mean of  $2.26 \pm 0.661$ , had positive protective health behaviors towards PUs prevention (Figure 1).

## DISCUSSION

The findings of this study were that nurses working in critical care units have had satisfactory health care behaviors toward pressure ulcer prevention. Three-quarters of nurses had positive health behaviors regarding the prevention of pressure ulcers. This means that all nursing staff working in the CCUs participating in this research have satisfactory behaviors that may positively affect their behavior towards preventing

pressure ulcers, and this concurs with the findings from other studies. The health behaviors of the participants regarding the prevention and care of pressure ulcers are reflected in their responses; according to which 82.3% of the nurses strongly or totally agree that patients are at potential risk of developing pressure ulcers, 72.9% say that most pressure ulcers can be avoided, 57.9% say that it is preferable for some pressure ulcers to remain "open in the air," and 84.1% say that continuous nursing assessment will give them an accurate calculation of the risk of developing pressure ulcers [5,11-13]. The majority of the respondents strongly agreed that most risk factors for PUs may be prevented, and a low rate of PUs among patients is an important indicator of good nursing care. These results are consistent with the study carried out by [11], who stated that most participants agreed on preventing most risk factors that contribute to PUs and that preventing PUs development is a crucial indicator of excellent nursing care that is provided to patients.



**Figure 1:** Distribution of the studied nurse’s regarding health behaviors prevention for pressure ulcer prevention and treatment for hospitalized patients (n=100).

**Table 2:** Comparison of participants’ health behaviors regarding pressure ulcers prevention

Variables	Groups	Positive health behaviors prevention	Negative health behaviors prevention	Statistical analysis	
		(n=74)	(n= 26)	$\chi^2$	P-value
		n(%)	n(%)		
Gender	Male	60(81)	10(38.5)	0.377	0.000
	Female	14(19)	16(61.5)		
Age Groups (year)	18-27	28(37.8)	0(0)	0.847	0.000
	28-37	38(51.4)	0(0)		
	38-47	8(10.8)	17(65.4)		
	≥48	0(0)	9(34.6)		
	Nursing school	0(0)	12(46.2)		
Educational level	Diploma	24(32.4)	10(38.4)	0.665	0.000
	College	44(59.5)	4(15.4)		
	MSc and PhD	6(8.1)	0(0)		
	Single	46(62.2)	0(0)		
Marital Status	Married	28(37.8)	22(84.6)	0.600	0.000
	Divorced	0(0)	2(7.7)		
	Widow	0(0)	2(7.7)		
Years of employment in nursing	≤ One year	18(24.3)	0(0)	0.921	0.000
	1-5 years	52(70.3)	11(42.3)		
	6-10 years	4(5.4)	6(23.1)		
	11-15 years	0(0)	5(19.2)		
	16-20 years	0(0)	4(15.4)		
	≤ One year	18(24.3)	0(0)		
Nurses experience in ward	1-5 years	52(70.3)	11(42.3)	0.818	0.000
	6-10 years	4(5.4)	6(23.1)		
	11-15 years	0(0)	5(19.2)		
	16-20 years	0(0)	4(15.4)		
Training course	Yes	56(75.7)	0(0)	0.669	0.000
	No	18(24.3)	26(100)		

The findings of the current study were in tune with a previous report [5], which found that the nurses showed favorable attitudes regarding the prevention of pressure ulcers (33.80±2.48). More than ninety-four percent of participants said nurses have crucial roles to play in avoiding PUs. These findings agreed with the study done by [14], who stated that the participants had a relatively positive attitude toward pressure ulcer

prevention. The findings of the study are in accordance with a study carried out to explore Jordanian nurses’ attitudes towards pressure ulcers. The sample of the study consists of 112 nurses who were working in three hospitals in Jordan. According to the study’s findings, Jordanian nurses had favorable health behaviors toward pressure ulcer prevention [15]. This finding is in good agreement with a study conducted among Iranian nurses

to examine knowledge, attitude, and behavior related to skin care, pressure injury prevention, and management. The results of this study's data analysis revealed that nurses' health behaviors concerning pressure ulcers were moderate. Nurses concluded that, based on the outcomes of this study, they should not be concerned about preventing pressure injuries at work. Nurses' inept behaviors toward preventing pressure injury appear to be justified by their lack of knowledge about the condition [6]. A study carried out in Irian to assess the knowledge, attitude, and behavior of nurses in preventing pressure injuries showed that the mean score of knowledge, attitude, and behavior of nurses regarding pressure injuries was relatively moderate and favorable [8]. The finding is consistent with other studies that found that students had a positive attitude toward pressure injury avoidance [16–18]. The association between socio-demographics and nurses' protective health behaviors towards pressure ulcer prevention was highly significant. The statistical analysis showed a highly significant association between nurses' protective health behaviors for all variables, which are age groups, gender, marital status, years of experience in hospitals, and years of employment in critical care units. These findings are in line with many studies that stated only the gender of staff nurses was statistically significant. Male staff nurses had a more favorable health behavior toward PU prevention than female staff nurses, according to the study. Other factors such as age, educational level, whether or not the nurses had undergone PU training, and whether or not they had read PU research papers had no effect on the nurses' health behaviors toward pressure ulcer prevention [19–21], positive correlation between them ( $p=0.300$ ;  $p=0.000$ ), and a significant difference in behaviors between levels of education ( $p=0.031$ ) and work departments ( $p=0.048$ ). Addressing the findings of the research could provide a clearer view of the current content of education and practice for nurses on pressure ulcers and can create a basis for pedagogical and practical training and motivation for health professionals in wound management [21]. These findings disagree with many studies that indicated there was no statistically significant correlation between the behavior scores of the nurses and their demographic data, such as age, sex, and clinical experience ( $p>0.05$ ). However, a statistically significant correlation exists between the attitude scores of the nurses and their educational level and previous training on PUP. Likewise, in another study, there was no statistically significant correlation between the behavior scores of the nurses and their age, sex, or clinical experience ( $p>0.05$ ) [22,16]. A study conducted in Egypt confirmed that there is a statistical relationship between age and gender, which means that these variables are related to each other and that some have an effect on the occurrence of others [23].

### Strengths and limitations

The strength of this study is using standard tools, which enhances the validity of the result and conclusion. The use of a self-reported questionnaire limits the in-depth understanding of the study variables; however, the large sample and the variety of health care sectors can compensate for this limitation.

### Conclusions

The study concluded that, based on the findings, the levels of attitude of critical care units' nurses toward preventing pressure ulcers were acceptable. Additionally, the findings suggest that nurses with postgraduate education have a more positive attitude regarding prevention. Nurses' positive responses may be utilized to achieve the overall goal of decreasing the incidence and recurrence of pressure ulcers among cancer patients. Though some trends may be deemed inevitable, continuous education and innovative approaches may be implemented to help fulfill the roles and responsibilities set for each nurse working in a critical setting.

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### Conflicts of interest

There are no conflicts of interest.

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### Data sharing statement

Supplementary data can be shared with the corresponding author upon reasonable request.

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