



## Assessment of Sultan Qaboos Comprehensive Cancer Care and Research Centre (SQCCRC) Nurses' Knowledge of Pressure Ulcers (PUs) Prevention and Treatments

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**Abstract:** Effective management of pressure ulcers(PUs) holds significant importance in the daily responsibilities of nurses operating within inpatient units. Hence, it is imperative for nurses to possess sufficient knowledge regarding the potential risks contributing to the onset of PUs, along with the skills to address complications that may exacerbate patient conditions. The objective of the current research was to identify the level of nurses' knowledge regarding (PUs) prevention and treatments among inpatient units' nurses in Sultan Qaboos Comprehensive Cancer Care and Research centre (SQCCRC). To describe the association between nurses' characteristics and the level of Nurses' Knowledge. A questionnaire that underwent modification and validation was employed to assess and measure the variables. A cross-sectional study recruited 148 nurses from SCCRC using census sampling. The result reveals the comprehensive knowledge level regarding pressure ulcer (PUs) prevention and treatment interventions was 61.3 out of 100, indicating a moderate level knowledge when evaluated with the 60% cut-off. Interestingly, age, years of experience, attending in pressure ulcer trainings, and engaging in reading SQCCRC policy emerged as the factors influencing nurses' level of knowledge. Education curricula for nurses are to be screened thoroughly and the identified knowledge gaps should be covered. Besides, multifaceted strategies are needed to improve clinical practice. Simulation scenarios related to PUs prevention and management will be an effective way to help nurses gain appropriate knowledge that can be applied in clinical practice. A thorough examination of educational curricula for nurses is necessary to address recognized knowledge gaps. Furthermore, it is crucial to incorporate diverse strategies to improve clinical practice. Utilizing simulation scenarios focused on (PUs) prevention and controlling emerges as an important approach to enable nurses to acquire pertinent knowledge applicable in real clinical settings.

**Keywords:** Nurse, Clinical practice, Prevention, Inpatient unit, Pressure ulcers.

## 1. Background

PUs persist as a substantial and intricate health issue in both hospital and community healthcare environments, contributing to human suffering, pain, disfigurement, loss of productivity, and financial burdens. The repercussions of pressure ulcers encompass considerable expenses. (Anthony et al., 2004; Bennett et al., 2004), heightened rates of infection (Ash, 2002), and prolonged duration of hospitalization (Anthony et al., 2004; Clark, 1998). Preventing pressure ulcers is largely within our control. (Anthony et al., 2004; EPUAP and NPUAP, 2009). Over the last twenty-five years, a multitude of clinical guidelines have been created and integrated into healthcare systems to facilitate informed decision-making for the enhancement of pressure ulcer prevention and management. (Clark, 1999). The initial guideline emerged in the Netherlands in 1985. Subsequently, the National Pressure Ulcer Advisory Panel (NPUAP) in the USA established updated guidelines four years later, followed by the Agency for Health Care Policy and Research (AHCPR) guidelines in 1992, the European Pressure Ulcer Advisory Panel (EPUAP) in 1998, and the National Institute for Clinical Excellence in 2003. A collaborative effort between

NPUAP and EPUAP resulted in a joint guideline publication in 2009. (EPUAP and NPUAP, 2009). In 2012, a Pan Pacific guideline was issued, further contributing to the evolving landscape of pressure ulcer prevention and management recommendations. (Australian Wound Management Association, 2012). There is no published evidence confirming the adoption of any of these guidelines in the Arab World. Pressure ulcer prevention programs encompass various elements, including risk assessment, training and education, repositioning, utilization of preventive measures and support surfaces, and regular skin assessment. Day et al. (1997) Indications suggest that proactive and continuous pressure ulcer prevention initiatives, incorporating meticulous skin assessment and care, frequent repositioning, and thoughtful selection of support surfaces, have shown substantial reductions in pressure ulcer incidence and treatment duration, along with notable cost savings. Essential to these programs are pressure ulcer training and education components, fostering awareness of prevention best practices. (Day et al., 1997; Banks, 1998; Clark, 1999). Multiple studies have been undertaken to assess how nurses implement strategies for pressure ulcer prevention and treatment. In a Dutch setting, Barrois et al. (2008)

Discovered that some inappropriate treatments, such as massage, were being utilized. Panagiotopoulou and Kerr (2004) identified that certain practices, now recognized as poor practice, such as the use of "donuts" and massage, were still considered acceptable in a Greek setting. Evidently, there exists a disparity between theoretical knowledge and practical application, as research findings have not seamlessly translated into clinical practices. Pancorbo-Hidalgo et al. (2007) Uncovered elevated levels of knowledge in a Spanish context, with approximately two-thirds of participants implementing prevention and treatment interventions. The study revealed that nurses holding a university degree, receiving specific education on pressure ulcers, or having been engaged in pressure ulcer research demonstrated superior knowledge and higher rates of implementation. Mockridge and Anthony (2001), At an English site, it was observed that senior staff exhibited greater knowledge regarding pressure ulcer treatment compared to their junior counterparts. In a Belgian setting, Gunningberg (2005) Identified insufficient knowledge regarding pressure ulcer prevention, with no apparent correlation between knowledge and the implementation of preventive measures. Data from Oman indicates a relatively low level of knowledge among nurses concerning pressure injury precautions. A majority of nurses were not acquainted with the wound management policy or various strategies for pressure ulcer prevention and management. (Al Shidi, 2016). Pressure ulcers constitute a substantial health concern for hospitalized patients globally. Various studies have indicated a wide spectrum of incidence rates, ranging from 0.78% to 39.3%. International investigations have reported prevalence rates between 4.3% and 25%, with specific figures for Germany at 4.3%, Republic of Ireland at 9%, the USA at 9.5%, Sweden at 17.6%, and the United Arab Emirates at 25%. In Bahrain, the prevalence stands at 12%, dropping to 7% when excluding grade I ulcers. (Al Shidi, 2016). Moreover, in Oman, the precise count of patients with pressure ulcers remains unknown. Based on the researcher's clinical observations, certain patients were admitted without pressure ulcers but developed them during their stay, while others entered with one pressure ulcer and eventually developed multiple ulcers. (Al Shidi, 2016). Nursing care concerning pressure ulcers faces shortcomings in terms of insufficient documentation, inadequate risk assessment, insufficient training, and a lack of comprehensive guidelines for both prevention and treatment. (Al Shidi, 2016). The introduction of tissue viability programs, encompassing pressure ulcer care in Oman, represents a nascent and evolving aspect of clinical practice. This underscores the necessity for evidence-based knowledge and robust research findings. The ongoing study marks the inaugural initiative of its kind at SQCCCRC Hospital, a prominent cancer treatment facility in Oman. Given the high susceptibility of cancer patients to pressure ulcers, this research addresses a critical gap in understanding and prevention.

## 2. Research Objective

General research objective for this study was to:

1. Assess the knowledge levels of SQCCCRC nurses regarding the prevention and treatment of pressure ulcers in hospitalized patients.

Specific research questions were to:

- 1- Investigate the correlation between nurses' age and their knowledge levels regarding the prevention and treatment of pressure ulcers in hospitalized patients.

- 2- Examine the association between nurses' gender and their level of knowledge concerning the prevention and treatment of pressure ulcers in hospitalized patients.
- 3- Explore the connection between nurses' education level and their knowledge levels regarding the prevention and treatment of pressure ulcers in hospitalized patients.
- 4- Investigate the relationship between attending a course in pressure ulcer prevention and treatment and the level of knowledge among nurses regarding the prevention and treatment of pressure ulcers in hospitalized patients
- 5- Examine the association between nurses' involvement in reading SQCCCS (presumably related literature, guidelines, or materials) and their level of knowledge regarding the prevention and treatment of pressure ulcers in hospitalized patients.

## 3. Method

### 3.1 Sitting and sample

This study was conducted in the Sultanate of Oman from November 8, 2023, to December 8, 2023. It employed a descriptive correlation design to assess the level of knowledge among SQCCCRC nurses regarding pressure ulcer prevention and treatment in hospitalized patients, as well as related factors. The total population comprised 186 expatriate and Omani nurses providing direct care in inpatient units. Utilizing Census sampling, all nurses in these units were included in the accessible population. Researchers distributed 186 questionnaires, yielding 148 responses and achieving an 88% response rate.

### 3.2 Instruments

The instruments employed in this study have been adapted from a previous study and consist of three distinct sections designed to measure various variables:

1. Professional and Demographic Characteristics: This section encompasses pertinent factors such as age, gender, educational background, years of experience, attendance at pressure ulcer-related training, and engagement with reading the SQCCCRC policy.
2. The variable "Pressure Ulcer Prevention and Treatment Interventions Knowledge" was measured using the PUKAT 2.0, an updated version of the Pressure Ulcer Knowledge Assessment Tool (PUKAT) initially developed at Ghent University, Belgium, in 2010. PUKAT 2.0 consists of 25 multiple-choice items, categorized into six themes, covering essential aspects of pressure ulcer prevention. Demonstrating strong psychometric properties, this tool is internationally applicable for assessing knowledge related to pressure ulcer prevention in nursing education, research, and practice. Participants will answer the multiple-choice questions, and a higher number of correct responses will reflect a higher score (Furtado et al., 2022). Score interpretation is as follows: 0 to 29 = very low; 30 to 59 = low; 60 to 89 = moderate; and 90 to 100 = high.

## 4. Data collection and ethical issues

The study commenced following the receipt of ethical approval from the SQCCCRC Committee of Research, with the IRB & EC project ID being (CCCCRC-21-2023). Rigorous measures were implemented to ensure the protection of participants from harm, deception, coercion, and any breach of confidentiality. The anonymity of respondents was safeguarded by withholding their

names and any identifiable features. Informed written consent was obtained from participants after a thorough explanation of the study, allowing them the opportunity to seek clarification and ask questions. Participants were made aware of their right to withdraw from the study at any point. Nurses were invited to participate voluntarily through an enrolment letter accompanying the questionnaire, wherein the research objectives and their right to decline participation were clearly outlined. The questionnaire, administered by the researcher, took approximately 20-30 minutes to complete. To maintain confidentiality, participants deposited the completed questionnaires in a sealed envelope in the designated box after completion.

## 5. Data analysis

Descriptive statistics were computed to delineate measures of demographic characteristics among the study participants, with a total of 148 questionnaires analyzed. There was no missing data, indicating a 0% rate for all variables. Non-response bias was evaluated by comparing the characteristics of primary and late participants, following the recommendation of Hair et al. (2006), who propose this as a widely used method in quantitative studies to assess nonresponse bias. The analysis revealed no significant

differences ( $p>0.05$ ) across all variables between the primary and late participants, suggesting that the research findings can be generalized to the population. Skewness and kurtosis tests were employed to assess data normality, and the results indicated a normal distribution as the skewness values fell between -2 to +2, and kurtosis values were between -7 to +7. The significance level for this study is set at ( $p<0.05$ ).

## 6. Result

The demographic variables considered in the study encompassed age, gender, years of experience, education level, attendance in a pressure ulcer prevention and treatment course, and engagement in reading SQCCRC policy. The reported participants' age ranged from a minimum of 23 years to a maximum of 48 years, with a mean age of 30.1 years. The majority of participants were female ( $n=113$ ), while male nurses constituted a smaller group ( $n=35$ ). A significant portion of the participants had up to 5 years of experience ( $n=80$ ), and the majority held a baccalaureate degree ( $n=139$ ). A considerable percentage of nurses had attended a pressure ulcer course (57.4%,  $n=85$ ), and a substantial number engaged in reading the hospital policy (73.6%,  $n=109$ ).

*Nurses' demographic characteristics*

| Category                                  | Number | Percentage |
|-------------------------------------------|--------|------------|
| <b>Gender</b>                             |        |            |
| Male                                      | 35     | 23.6%      |
| Female                                    | 113    | 76.4 %     |
| <b>Years of experience</b>                |        |            |
| Less than 1 years                         | 40     | 27%        |
| 1-5 years                                 | 40     | 27%        |
| 6-10 years                                | 28     | 18.9%      |
| 11-15 years                               | 33     | 22.3%      |
| 16-20 years                               | 2      | 1.4%       |
| More than 20 years                        | 5      | 3.4%       |
| <b>Highest degree hold</b>                |        |            |
| Bachelor's                                | 139    | 93.9%      |
| Master degree                             | 9      | 6.1%       |
| <b>Attending course in pressure ulcer</b> |        |            |
| Yes                                       | 85     | 57.4%      |
| No                                        | 63     | 42.6%      |
| <b>Reading the SQCCRC policy</b>          |        |            |
| Yes                                       | 109    | 73.6%      |
| No                                        | 39     | 25%        |

The descriptive statistics for the level of knowledge are presented as percentages: 0 to 29 = very low; 30 to 59 = low; 60 to 89 = moderate; and 90 to 100 = high. The results indicate that the majority of nurses scored between 60-80% ( $n=110$ ), signifying a moderate level of knowledge. Nurses scoring in the range of 30-60% were ( $n=37$ ), reflecting a low level of knowledge, and only ( $n=1$ ) demonstrated a very low level of knowledge. The mean level of knowledge for SQCCRC is calculated at 61.3%, indicating a moderate level of knowledge based on the instrument's cut-off point of 60%. The distribution of scores is presented in the table below.

*Level of nurses' knowledge*

| Level of knowledge | Number | Percent |
|--------------------|--------|---------|
| High (90-100)      | 0      | 0       |
| Moderate (60-89)   | 110    | 74.3%   |
| Low (30-59)        | 37     | 25%     |
| Very low (0-29)    | 1      | 0.7%    |

Appropriate statistical analyses were applied to evaluate the relationships with the variables. The Pearson correlation results revealed a significant ( $p < 0.05$ ) relationship between participant age and the level of practice, with a coefficient of (0.27). The results of independent T tests indicated no significant relationship between gender, education level and level of practice. While there are a significant relationship between reading SQCCCRC and the level of practice. However, a significant relationship was observed between attending courses in pressure ulcer management and the level of practice ( $p < 0.05$ ). The ANOVA test demonstrated a significant difference in the mean knowledge score among different groups of years of experience ( $P < 0.05$ ).

## 7. Discussion

In the present investigation, nurses in the SQCCCRC inpatient unit achieved a mean score of 61.3 out of 100 on the Pressure Ulcer Knowledge Assessment Tool 2.0 (PUKAT 2.0). The study established a threshold of 60% as indicative of a sufficient and moderate level of knowledge. Similar to our findings, various studies reported that nurses exhibited satisfactory knowledge regarding pressure ulcer prevention, with percentages of 77% in Cyprus (Charalambous et al., 2019), 70% in Australia (Barakat-Johnson et al., 2018), and 64.4% in Nigeria (Fulbrook et al., 2019). However, a systematic review and meta-analysis by Dalvand et al. (2018) indicated a lower level of nurses' knowledge (55.4%, 95% confidence interval: 42.4–68.4) compared to the recommended 60% for pressure ulcer prevention. There is variability across studies on this matter; Halász et al. (2021) reported insufficient knowledge (45.5%) among nurses regarding pressure ulcer prevention. In contrast, Abd El Gawad Sallam et al.'s (2020) study in Hail, Saudi Arabia, yielded incomparable findings with an average score of 40.53%. Additionally, a study by De Meyer et al. (2019) in 16 Belgian hospitals, using the same assessment tool, reported a mean score of 50.7%.

The present study did not find statistically significant differences in mean scores among nurses when categorized by various demographic and professional factors, including gender and educational level. This contradicts other studies suggesting that nurses with a master's degree are more likely to have satisfactory knowledge of pressure ulcer prevention (Lotfi et al., 2019; Ghosh, 2019). Furthermore, our findings differ from a study that reported an association between gender and the level of nurses' knowledge (Ghosh, 2019). In line with our results, De Meyer et al.'s (2019) study demonstrated that nurses who had undergone additional training in pressure ulcers or wound care and had read hospital policies achieved significantly higher total knowledge scores, consistent with trends across several studies. The data analysis results also suggest that nurses with varying years of experience have different levels of knowledge, supported by another study which found that experienced nurses have a higher level of knowledge than recently graduated nurses (Barakat-Johnson et al., 2018).

## 8. Conclusion and Implications for Practice

The limited knowledge among nurses regarding pressure ulcer prevention may compromise the quality of patient care and increase the risk of pressure ulcer development. While the findings indicate a sufficient level of knowledge based on the 60% cutoff using the PUKAT 2.0, there is room for further improvement. The results can serve as a foundation for developing a comprehensive

action plan to address the knowledge gap in pressure ulcer prevention among nurses. Implementing simulations related to pressure ulcer prevention and management could be an effective strategy to enhance nurses' practical knowledge and application in clinical settings. Guerrero et al. (2022) suggest that high-fidelity simulations can improve critical thinking skills and learning retention among nurses.

Routine evaluations of nurses' knowledge in pressure ulcer prevention, assessment, and management may help nurse administrators and educators identify strengths and weaknesses, providing a basis for developing simulation scenarios. All interventions should be evidence-based to reduce the occurrence of pressure ulcers and associated complications. Continuous nurturing of nurses' knowledge with updated evidence-based practices is essential for effective pressure ulcer prevention, ultimately improving the quality of care provided.

However, it's important to acknowledge some limitations in the current research. Conducting the survey during different nursing duties may have allowed participants to search for answers on the internet, potentially influencing the results. This aspect should be considered when interpreting the findings and underscores the need for future studies to address this limitation.

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## Abbreviation

SQCCCRC: Sultan Qaboos Comprehensive Cancer Care and Research Centre

PU: Pressure Ulcers

PUKAT 2.0 Pressure Ulcer Knowledge Assessment Tool 2.0

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