

Practice and perceived barriers regarding prevention of Pressure ulcer among nurses of a tertiary care hospital

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Abstract

Background: The incidence of pressure ulcers varies between developed and developing countries, with reported rates of 8.3% to 25% in developed countries and 2.1% to 31.3% in developing countries. The estimated cost of treating pressure ulcers is 2.5 times higher than the cost of preventing pressure ulcers. The aim of the study was to assess practices and perceived barriers regarding the prevention of pressure ulcers among nurses at a tertiary care hospital.

Methods: An embedded mixed-method design was used to study nurses' practices and perceived barriers regarding the prevention of pressure ulcers. Through census sampling, 108 nurses from selected wards of Kathmandu Medical College Teaching Hospital were included in the study. Data were collected using a structured questionnaire, observational checklist, and focus group discussion. After data collection, quantitative data were coded and entered into the Statistical Package for the Social Sciences (SPSS) program, version 20. Descriptive and inferential statistics were used. For qualitative data, themes were generated through content analysis.

Results: About 65.7% of the participants had good practices for the prevention of pressure ulcers, and there was a significant association between the area of work and training ($p \leq 0.05$) with practices. Participants also perceived barriers to prevention practices, such as lack of resources, followed by patient-related barriers like comorbidities.

Conclusion: The study findings concluded that nurses' practices regarding the prevention of pressure ulcers were good, though there were barriers to these practices.

Keywords: Perceived barriers; practice; pressure ulcer

Declarations

Ethics approval and consent to participate: Ethical approval obtained from the Institutional Review Committee, Kathmandu Medical College and Teaching Hospital (Ref no.: 1009201920). Written informed consent was taken from all the participants.

Consent for publication: Consent was taken from the participant for publication of research data along with the manuscript.

Availability of data and materials: The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request. All relevant data are within the manuscript.

Competing interest: None

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Authors' contributions: BM, NBL: contributed to the design of the study, data collection; BM, SBP: data analysis and interpretation; BM: manuscript preparation; All authors read and approved the final manuscript.

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BACKGROUND

A pressure ulcer is defined by the National Pressure Ulcer Advisory Panel (NPUAP) and European Pressure Ulcer Advisory Panel (EPUAP) as “localized injury to the skin and/or underlying tissue usually over a bony prominence as a result of pressure, or pressure in combination with shear and/or friction.” A patient with a pressure ulcer has a two to six times higher mortality risk than a patient with intact skin [1].

A pressure ulcer is common in high and middle-income countries but it is rarely researched in low-income countries. Pressure ulcer (PU), also called bedsore, ranges from areas of slightly discolored skin to areas of deep purulent wound cavities that extend to underlying muscle and bone [2].

The grading of pressure ulcers according to internationally accepted grading systems are; stage I as non-bleachable discoloration; stage II as the partial thickness of skin loss involving the epidermis, shallow ulcer without undermining of adjacent tissue; stage III as the full thickness of skin loss, involving damage of epidermis and or dermis and stage IV as the full thickness of skin loss, involving damage of epidermis and or dermis extending to bone tendon or joints [3].

Among adult patients, the incidence of pressure ulcers varies from 0 to 12% in acute care, 24.3 to 53.4% in critical care, and 1.9 to 59% in an elderly care setting. Lack of time, shortage of the staff, patient's condition, and lack of resources or equipment are the major barrier for nurse's face to prevent ulcer [4]. Pressure ulcer prevention care protocols vary between hospitals but basic use of low-pressure beds, positioning and turning and barrier cream with hydrocolloid over the area at risk reduces the ulcer [5]. Several studies have shown showed that shortages of human resources and supplies are the most important barriers to pressure ulcer prevention [6]. The estimated cost of treating pressure ulcers is 2.5 times higher than the cost of prevention of pressure ulcers [7].

The general objective of the study is to assess nurses' practices and perceived barriers regarding the prevention of pressure ulcers in a tertiary hospital. The specific objectives are: to assess the level of nurses' practices regarding pressure ulcer prevention among general ward nurses and nurses in medical and surgical high-care units and intensive care units (ICU); to explore the association between levels of nurses' practices regarding pressure ulcer prevention and selected socio-demographic variables; and to examine the perceived barriers to pressure ulcer prevention among nurses in general wards and medical and surgical high-care units and ICUs.

METHODS

An embedded mixed-method research design was adopted, where both quantitative and qualitative data were collected and analyzed simultaneously, and the analyzed data were integrated in the end [8]. Kathmandu Medical College Teaching Hospital (KMCTH) was selected as the study site due to its 750-bed capacity and high patient turnover. The target population comprised all nurses working at KMCTH, while the study population included nurses working in selected wards of the hospital. The selected wards were categorized into general wards, high care units, and intensive care units (ICU). The general wards included medicine, surgery, orthopedic, plastic surgery, and neuro-cardiac wards, while the high care units included the medicine and surgery high care units. The ICU included the medicine ICU, surgery ICU, and neuro ICU.

Census sampling was used for the quantitative study, and purposive sampling was used for the qualitative study. In the quantitative study, all nurses working in the selected wards were included as samples. Although the actual sample size was 118, only 108 nurses were included in the study because five had resigned, two were on maternity leave, and three were shifted to other wards. In the qualitative study, two focus group discussions (FGD) were conducted: FGD-1 with participants from the ICU and high care units, and FGD-2 with participants from the general wards. The sample size for the FGDs was 13, with six participants in FGD-1 and seven in FGD-2.

The inclusion criteria were nurses who had worked for at least three months in the selected wards. Exclusion criteria included nurses on long-term leave (e.g., maternity leave, study leave, or sick leave) and nurses working in managerial positions such as matrons, assistant matrons, or in-charge nurses. For the quantitative study, a self-developed structured questionnaire was used to collect socio-demographic data, and a validated checklist by Shrestha R. [9] was used to assess practices. The checklist consisted of 31 statements related to practices, where correct practices were scored as 1, and incorrect practices as 0. The total score for each participant was calculated, with scores greater than or equal to the mean categorized as “good practice” and scores less than the mean as “poor practice.” For the qualitative study, focus group discussions (FGD) using semi-structured guidelines were conducted to explore perceived barriers to pressure ulcer prevention.

In terms of data collection, for the quantitative data, the purpose and procedure of the study were explained to participants, and written informed consent was obtained. Each participant was observed at least three times to ensure a representative picture of their practices. The first

observation was announced, but the subsequent two were unannounced. Observations were conducted during the morning (7:00–11:30 AM) and afternoon (1:00–4:00 PM) shifts to cover key times for providing physical care, such as skin integrity assessments, repositioning, back care, and exercises. Night shift nurses were observed during their morning and evening shifts when their duty schedules changed. The researcher spent two months observing practices related to pressure ulcer prevention.

For the qualitative data, the time, date, and location for the FGDs were decided based on participants' convenience. Invitations were sent to participants, and written informed consent was obtained before the discussions. Participants were seated, and each was given a code (R1, R2...R6 for FGD-1 and R1, R2...R7 for FGD-2). The FGD started with introductions and an explanation of the study's objectives, followed by questions. All participants were encouraged to participate actively in the discussion. The field note taker documented the discussion, and the entire conversation was recorded using an audio recorder. The FGDs lasted between 60 to 90 minutes, with small refreshments provided.

For the quantitative data, a validated checklist by Shrestha R. [9] in India was used for assessing practices.

For the qualitative study, trustworthiness was ensured through several strategies:

- **Credibility:** Maintained through triangulation, peer briefing, and member checks.
- **Dependability:** Ensured via triangulation, peer examination, and audio recording.
- **Transferability:** Addressed by providing thick descriptions and purposive sampling.
- **Confirmability:** Supported through triangulation and an audit trail.

Data analysis for the quantitative study was conducted using descriptive and inferential statistics in SPSS version 20. Descriptive statistics, such as frequency, percentage, mean, and standard deviation, were used to describe socio-demographic variables and practices for preventing pressure ulcers. Inferential statistics, including the chi-square test and likelihood ratio, were used to examine associations between practice levels and socio-demographic variables at $p \leq 0.05$. The analyzed data were presented in tables. For the qualitative study, themes were generated through content analysis. The tape-recorded discussions were transcribed in Nepali and then converted into English. The transcripts were read and re-read to ensure familiarity, followed by coding, grouping, and theme abstraction based on common opinions.

Ethical clearance for the study was obtained from the Institutional Review Committee at KMCTH. All participants were fully informed about the study, and written consent was obtained. Confidentiality was maintained throughout the study, and all data were recorded anonymously. Participants were not coerced into participating and had the right to withdraw at any time.

RESULTS

The mean age of the 108 participants was 26.77 years ($SD = 2.98$), with the majority (55.6%) falling within the 26 – 30 years age range (**Table 1**). Most participants (87.0%) were Hindu, and 60.2% held a bachelor's degree. The largest group (46.3%) worked in the ICU. Majority (79.6%) had not received any formal training, while 22 (20.4%) participants had received training related to ICU care and spinal cord injury rehabilitation, which also covered the topic of pressure ulcer prevention.

Table 1: Socio-demographic profile of the participants. (n = 108)

Characteristics	Frequency	Percent (%)
Age group (in years)		
21-25	38	35.2
26-30	60	55.6
31-35	9	8.3
36 and above	1	0.9
Mean \pm SD = 26.77 \pm 2.98 years		
Religion		
Hindu	94	87
Buddhist	6	5.6
Christian	8	7.4
Qualification		
PCL	43	39.8
Bachelor Degree	65	60.2
Job experience (in years)		
1-5	65	60.2
6-10	36	33.3
11 and above	7	6.5
Mean \pm SD = 5.26 \pm 2.69 years		
Area of working		
General ward	41	37.96
High care unit	17	15.74
Intensive care unit(ICU)	50	46.3
Related training		
Yes	22	20.4
No	86	79.6

The overall level of practice regarding the prevention of pressure ulcers was good (Table 2), with 71 (65.7%) nurses demonstrating appropriate practices. This indicates a good overall level of practice, as the current findings showed scores equal to or above the mean score.

Table 2: Practice regarding prevention of pressure ulcer (n = 108)

Practice	Level		Mean score ± S.D	Total score
	Good Frequency (%)	Poor Frequency (%)		
Assessment	93 (86.1)	15 (13.9)	4.22 ± 1.35	6
Nursing diagnosis	79 (73.1)	29 (26.9)	0.73 ± 0.44	1
Planning	52 (48.1)	56 (51.9)	0.48 ± 0.50	1
Implementation	63 (58.3)	45 (41.7)	10.72 ± 4.63	20
Evaluation	108 (100)	0 (0)	2.00 ± 0.00	2
Overall	71 (65.7)	37 (34.3)	18.48 ± 6.03	31

The chi-square test was conducted to determine the association between the level of practice and demographic variables (Table 3). The results showed that the area of work ($p < 0.001$) and training ($p = 0.02$) were significantly associated with the level of practice at $p \leq 0.05$.

Table 3: Association of practice with selected socio-demographic variables (n = 108)

Socio-demographic characteristic	Level of practice		p value
	Good practice Frequency (%)	Poor practice Frequency (%)	
Age in years			
21-25	21 (55.3)	17 (44.7)	0.23 [#]
26-30	42 (70.0)	18 (30.0)	
31 and above	8 (88.8)	2 (22.2)	
Religion			
Hindu	63 (67.0)	31 (33.0)	0.63 [#]
Buddhist	4 (66.7)	2 (33.3)	
Christian	4 (50.0)	4 (50.0)	
Qualification			
Diploma	27 (62.8)	16 (37.2)	0.68
Bachelor Degree	44 (67.7)	21 (32.3)	
Job experience			
1-5	40 (61.5)	25 (38.5)	0.52 [#]
6-10	26 (72.2)	10 (27.8)	
11 and above	5 (71.4)	2 (28.6)	
Area of working			
General ward	5 (12.2)	36 (87.8)	<0.001****
High care unit	16 (94.1)	1 (5.9)	
Intensive care unit(ICU)	50 (100.0)	0 (0)	
Training			
Yes	19 (86.4)	3 (13.6)	0.02*
No	52 (60.5)	34 (39.5)	

Note: *: significant at $p \leq 0.05$; ***: highly significant; #: likelihood ratio

Perceived barriers regarding pressure ulcer prevention among nurses

The following themes were identified from FGD-1 and FGD-2 regarding perceived barriers to pressure ulcer prevention: resources, knowledge, job satisfaction, patient-related barriers, and the prioritization of other care over pressure ulcer prevention.

Table 4a: Content analysis of FGD (n=13)

Theme	Sub-theme	Description
Knowledge	Lack of In-service education	Both groups agreed that in-service education might update the knowledge and increase competency in related fields. Hence, the lack of in-service education can be one of the barriers to prevention practices.
	Gap between theory and practice	All participants from both groups agreed that what they study in theory doesn't apply in clinical setting practice (e.g., some principles of back care cannot be followed during clinical hours, and the nursing process cannot always be applied while caring for patients).
Job satisfaction		The majority of participants in the FGD - 2 agreed that due to dissatisfaction with the job, they become frustrated and cannot give full attention during care. However, FGD - 1 totally disagreed, stating that it would be beyond nursing ethics if patient care were compromised due to personal dissatisfaction.
Other care are more priorities than pressure ulcer		All participants from FGD - 2 gave first priority to other nursing activities, such as medication, vital signs, doctor rounds, investigation collection and admission, rather than the prevention of PUs. This was because most patients in general wards were active and could perform ADLs (activities of daily living) by themselves. On the other hand, FGD - 1 concluded that all nursing activities were equally important and their clinical shift usually starts with basic patient care such as bed making, positioning and skin assessment and care.

Table 4 b: Content analysis of FGD (n=13)

Themes	Sub-theme	Description
Resources	Inappropriate nurse to patient ratio (Human resources)	Both the group agreed that assigning more assigned patients to a single nurse made it very difficult to provide quality nursing care to individual patients and resulted in a heavy workload. Therefore, schedule care (e.g., positing, back care) couldn't be carried on time.
	Guideline	Most of the participants in FGD - 1 agreed that if there were guidelines for pressure ulcer prevention, then they could follow them, and it would help guide their practices for prevention. However, no one in FGD - 2 mentioned this as a barrier, as they were not aware of the availability of guidelines regarding pressure ulcer prevention.
	Material resources	The majority of participants from the FGD - 2 agreed that lack of material resources (e.g. dressing sets) and the use of non-functioning equipment (e.g. air mattress) were barriers to the prevention of pressure ulcer. On the other hand, FGD - 1 disagreed, stating that, according to them, there was always an abundant supply of resources for prevention practices of pressure ulcer.
Patient related barrier		Both groups concluded that various patient-related factors, such as skin type, co-morbidities and non-cooperative behavior, were barriers to pressure ulcer prevention. For example, some patients had sensitive skin, which easily developed blisters that predispose them to PU, and co-morbid conditions like diabetes mellitus (DM), hemiplegia also played role in the development of PU

Interpretation Based on the Quantitative and Qualitative Results (Triangulation)

Despite perceiving multiple barriers, the participants demonstrated good practice in pressure ulcer prevention. Among all steps of the nursing process, the planning and implementation phases had low scores. This finding was supported by the qualitative study, where participants perceived a lack of resources, such as human resources, materials, and guidelines, as precipitating factors for pressure ulcer formation, followed by patient-related factors such as co-morbidities.

DISCUSSION

The present study showed that the majority of participants (55.6%) were within the age range of 26-30 years, which was consistent with a study conducted in Lahore [10], where 52.6% of participants were also in this age range. Additionally, this study found that 79.6% of participants had not received any training related to pressure ulcers, which aligned with a study conducted in Nigeria [11], where 71.7% of participants reported not receiving any training. The study also revealed that 46.3%

of participants worked in the Intensive Care Unit (ICU), a finding that was similar to a study in Jordan [12], where 53.6% worked in critical care units.

The present study showed that 65.7% of participants had good practices for the prevention of pressure ulcers, which was slightly lower than a study conducted in Bangladesh [13], where 77.55% of participants reported good practices. The difference in results could be attributed to high level skin care practices.

The study conducted in Saudi Arabia [6] found that heavy workload and staff shortages were the most common barriers faced by nurses in preventing pressure ulcers, which is consistent with the findings of the present study. Similarly, another study from Saudi Arabia [14] identified patient condition, lack of appropriate application of preventive measures, lack of time, lack of cooperation as perceived barriers to pressure ulcer prevention, which also aligns with the present study's findings.

The strength of the study lies in its provision of baseline data regarding nurses' practices for pressure ulcer prevention. The findings can help institutions develop or revise plans and policies related to pressure ulcer prevention. The study also has important implications for nursing practice, administration, education, and research regarding pressure ulcers.

There were some limitations to the study. The use of a non-probability purposive sampling technique might have created sampling bias, which could limit the generalizability of the findings. Additionally, the observational method might have introduced a Hawthorne effect, where participants alter their behavior because they are being observed.

CONCLUSION

Based on findings, the study concluded that good practices were observed in the prevention of pressure ulcers. However, low practices were noted in the planning and implementation phases, which may have been due to participant's perceived barriers, such as lack of resources (human, material, and guidelines) and patient-related factors (co-morbidities). To improve practices for pressure ulcer prevention, hospitals should provide a supportive environment, adequate resources, formulate guidelines, and offer in-service education to staff nurses. Similar studies could be conducted among different populations, such as students or caregivers, to explore variations in practices. A comparative study between different hospitals could also provide valuable insights.

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