

Nurses' Practice on Prevention of Pressure Ulcer among Immobilized Patients

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ABSTRACT

Introduction: Pressure ulcer is a common health problem among immobilized patients. Consequences of pressure ulcer are pain and discomfort, delay restoration, increase in length of hospital stay, economic burden and eventually death. The incidence of pressure ulcer and its complications are preventable with the appropriate use of preventive measures.

Methods: A cross-sectional non participatory observational study was conducted among 62 immobilized patients using non- probability purposive sampling technique between September and November 2019. Data were obtained using structured observational checklist and analyzed by both descriptive and inferential statistics.

Results: Good nursing practice for prevention of Peptic ulcer was observed among 5% patients. However, 90% patients received good practice for minimizing moisture. Frequent change of position and use of air mattress for prevention of pressure ulcer among immobilized patient was 11.3%. A low negative correlation was found between Braden-Scale and nursing practice ($r = -0.28$, $p = 0.024$) and weak positive correlation was found between age and BMI with nursing practice ($r = 0.195$, $p = 0.129$ and $r = 0.162$, $p = 0.209$ respectively).

Conclusions: Overall, very few patients received good nursing practice suggesting the need to increase quality nursing care to prevent pressure ulcers.

Keywords: Braden scale, Immobilized patient, Nursing practice, Pressure Ulcer.

Introduction

Pressure ulcer (PU) is a 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. Though preventable, it is a global problem among immobilized patients.¹ Lack of repositioning, friction and/or shear, prolong hospital stay, low Braden score, elderly patient and co morbidities are the factors that lead to PU.² Consequences of PU are pain and discomfort, prolong illness, delay restoration, increase length of hospital stay, increase cost of health care, disability and even death.³

The overall prevalence of PU in the USA is nearly 2.5 million and more than 60,000 patients die each year.⁴ The reported prevalence of PU is variable in different countries 5.6% (in Brazil)⁵ to 30% (in Canada).⁶ In Nepal, it is 25% among immobilized patient.⁷ The variation of prevalence in different countries is due to participant's characteristics,

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age, length of stay in hospital, disease conditions, nursing care quality and guidelines for prevention and management of PU.⁸ PU develops due to immobilization, altered sensory perception, poor nutritional status, moisture, friction and shear. Elderly population as well as patient with low Braden score, high and low body mass index (BMI) have higher chances of developing PU. The prevalence and complications of PU are preventable to some extent by utilizing good nursing practice. It includes skin assessment, frequent positioning, skin care, use of support surface and patient education. About 42% patients received adequate nursing practice regarding prevention of PU in Germany.⁹ Similarly, good practice was observed among 10.3% nurses in Pakistan³ and a very low level of nursing practice i.e. 46.45% (below 60% was categorized as very low level using LIKERT scale) in Nepal.¹⁰ Nurses are the key persons who are involved in quality care of the patients. Regular skin assessment, repositioning, skin care, use of support surface, patient educations on nutrition are the nursing activities to prevent pressure ulcer. Although the prevalence rate is in decreasing order, however, the nursing practice in the patient is still inadequate. Studies done in Nepal were only from questionnaire method however, that does not measure the accuracy of nursing practice. Hence, this study focuses on observing the nurses' practice and examining the relationship between age, body mass index, Braden score of patient and nursing care received for prevention of pressure ulcer among immobilized patients who were in moderate to high risk for developing pressure ulcer. This study will be helpful to find out the level of nursing practice on preventive measures of pressure ulcer among immobilized patient and to sensitize the nursing or higher authority for future action to enhance quality nursing care in the prevention of pressure ulcer.

Methods

It was a cross-sectional, non participatory observational study carried out in Patan Hospital, Patan Academy of Health Sciences (PAHS), Nepal. All the immobilized patients of Medical, step down, geriatric and orthopedic wards of Patan Hospital from September to November 2019 were taken as the study population using purposive sampling technique for the selection of the samples. The immobilized patients were selected by observing patient's condition and patient's chart for the diagnosis and risk assessment was done by using Braden risk assessment tool. A self developed observational checklist (after doing face validity and content validity) was used for observation of nursing practice. The tool contains 5 domains of the total 15 items; (1) skin assessment; 2 items, (2) repositioning; 2 items, (3) skin care; 4 items, (4) support surface; 5 items, and (5) patient or caregiver education; 3 items. There were

3 options: "done," "not done," and "not applicable" in the checklist where, done denoted "2", not done, denoted "1," and not applicable denoted "0". The total score ranged from 0 to 30. The mean value of the total score was 22.5. Thus, a score below the mean value was considered poor practice, and a score more than the mean value was deemed to be good nursing practice. The study was reported using the EQUATOR guideline for participatory action research. Inclusion criteria were immobilized patients, age more than 18 years and those who had Braden risk assessment score less than 15. The patients/caregivers who were not willing to participate and immobilized patients with pressure ulcer were excluded from this study. Permissions were obtained from School of Nursing and Midwifery (LNC), PAHS and Nursing Director of Patan Hospital. The ethical approval was obtained from IRC, PAHS (PNA 1908041283) before the data collection. The nursing care received by the patients was kept with strict confidence and the anonymity was assured. Patients had right not to be observed the nursing practice if they felt discomfort at any time during the observation. Data processing and analysis were done using Statistical Package for the social science (SPSS) version 16. Patient information and level of practice were analyzed using descriptive statistics. Data were checked for normality using Kurtosis and skewness. The relationship between variables was examined using Pearson correlation analysis.

Results

The mean age of the participants was 67.87 ±16.59 years. Among the participants, more than 60% of the patients were older than 65 years. Regarding body mass index (BMI), about 40% had a BMI > 25. Similarly, regarding the Braden score, about 40% of participants had scores of 9-12, which falls on high to very high risk for pressure ulcer, and the average hospital stay was for 6 days, previous hospital stay was 69.4 % . More than one-third of the patients 33.9% were diagnosed as Stroke less than one third patients were Cancer, Liver disease, Kidney disease and Diabetes (Table 1).

Table 1: Patients' demographic and clinical characteristics: N=62

Variables	Frequency	Percentage
Age in years		
21-45	8	12.9
46-65	16	25.8
Above 65	38	61.3
Body mass index(BMI) in kg/m²		
<18.5	18	29.0

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18.5-24.9	19	30.6
25.0-29.9	17	27.4
≥30	8	12.9
Braden score		
<9	3	4.8
9-12	20	32.3
13-14	39	62.9
Length of hospital stay in days		
≤5	43	69.4
6-10	13	21.0
>10	6	9.7%
Previous hospital stay		
Yes	43	69.4
No	19	30.6
Diagnosis		
Stroke	21	34
Respiratory cases	11	17.7
Ortho cases	11	17.7
Others	19	30.6

care to support surface “use of pillows as positioning devices for back support.” And education on preventive measures and consequences of PU was provided to more than 75% of patients (Table 3).

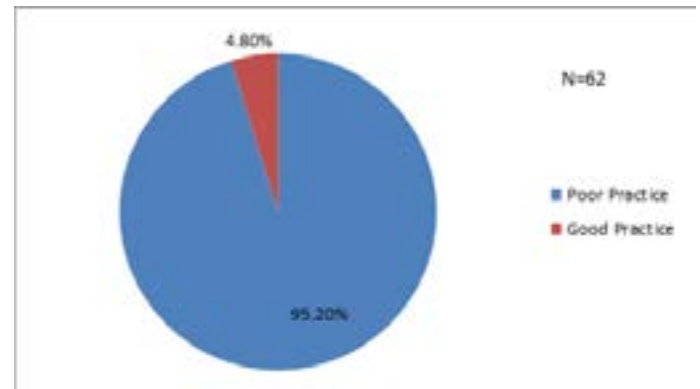


Figure 1. Distribution of level of nursing practice

Regarding the overall level of nursing practice, only 4.8% of patients received good nursing practice (Figure 2). However, most patients (90.3%) received skin care to minimize skin exposure to moisture, keeping the bed wrinkle-free and only 8.1% patients were provided back care (Table 2). Similarly, about 50% of patients received

Table2: Distribution of frequency: assessment of skin, repositioning and skin care. N = 62

Variables	Done n (%)	Not done n (%)	Not Applicable n (%)
Assessment of skin			
Performs head to toe skin assessment	21(33.9)	41(66.1)	
Performs skin inspection in each turning on bony prominence	3(4.8)	59(95.2)	
Repositioning			
Change position frequently as appropriate (2 to 4 hourly)	7(11.3)	55(88.7)	
Head of the bed elevation not more than 30° approximately	22(35.5)	24(38.7)	16(25.8)
Skin care			
Minimizes skin exposure to moisture	56(90.3)	6(9.7)	
Provides back care with application of moisturizing agent	5(8.1)	57(91.9)	
Keeps the bed linen smooth and wrinkle free	56(90.3)	6(9.7)	
Uses draw sheet for shifting the patient to minimize friction	6(9.7)	56(90.3)	

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Table3: Distribution of frequency: support surface and patient/care giver education N = 62

Variables	Done n (%)	Not done n (%)	Not Applicable n(%)
Support surface			
Uses pillows as positioning devices for back support	30(48.4)	32(51.6)	
Uses pillows between the knee and ankles	4(6.5)	43(69.3)	15(24.2)
Uses air mattress as appropriate	7(11.3)	55(88.7)	
Uses heel support devices as appropriate	1(1.6)	48(77.4)	13(21)
Patient and care giver education			
Teaches the patient and caregivers as appropriate about nutritional diet (i.e. high protein and high calorie nutritional supplement)	23(37.1)	39(62.9)	
Encourages for adequate fluid intake but considers individual's co-morbid conditions.	15(24.2)	47(75.8)	
Gives education to patient and caregivers on preventive measures of pressure ulcer as well as consequences of pressure ulcer.	48(77.4)	14(22.6)	

The Braden score and nursing practice had significant negative correlation, ($r=-.287$, $p= 0.024$) meaning that the lower the Braden score higher/good nursing practice was provided. However there was no statistically significant relationship between age($r=.195$, $p=.129$), BMI ($r= .162$, $p= .209$) and nursing practice (Table 4).

Table 4. Bivariate Pearson correlation between age, BMI, Braden score and nursing practice N = 62

Variables	Age	BMI	Braden score	Nursing practice
Age	1			
BMI	-.157	1		
Braden score	-.286*	.024	1	
Nursing practice	.195	.162	-.287*	1

* Correlation is significant at P value 0.05 levels (2- tailed)

DISCUSSION

A cross-sectional observational study was conducted to find out the level of nursing practice among immobilized patients for the prevention of pressure ulcer.

The first objective of the study was to assess the level of nursing practice in prevention of pressure ulcer among immobilized patients was divided into two categories, Good and Poor nursing practice. Good nursing practice was observed in three patients 4.8% whereas poor nursing practice was observed in 95.2% patients. The result of this study revealed that patients were not receiving adequate pressure ulcer preventive measures. A study conducted in Pakistan among 243 nurses showed 10.3% had good nursing practice.³ A study was conducted using

questionnaire method among 98 nurses working at ICU/CCU of 3 different hospitals of Kathmandu, Nepal showed very low level of nursing competency.¹⁰ Similarly, in a study conducted using questionnaire method among 91 nurses in Bangladesh showed 42.9% of nurses had high level of nursing practice.¹¹ However these study findings cannot be directly compared with this study finding because those findings were from questionnaire methods. The result of this study contradicts with another study among 32 nurses in Germany showed 42.2% patient received good nursing practice where pressure ulcer prevention guideline was followed, and risk assessment scale was used in all patients during admission time.⁹

Second objective of the study was to determine the relationship of age, BMI and Braden score with nursing practice. There was significant but weak negative correlation between Braden score and nursing practice (i.e. $r = -.28$, $p= 0.02$) meaning that the study patients who had lower Braden score, had received higher nursing practice which is in consistent with the theoretical aspect as lower Braden score is the sign of higher risk for pressure ulcer.^{8,12} Similarly, positive relationship was found between age and nursing practice ($r=.19$, $p=.12$) and BMI and nursing practice ($r= .16$, $p= .20$) though both were non-significant. Thus the direction of relationships in line with the hypothesis made. It has been explained that higher the age, higher the chance of having pressure ulcer thus needing higher nursing care. Similarly, the higher the BMI there is chance of having pressure ulcer requiring higher nursing care.¹³

Good nursing practice for pressure ulcer prevention is the nurses' priority. In the context of Nepal, there is no practice of using pressure ulcer risk assessment scale. Though they do not use risk assessment scale, the findings of this study

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shows that nurses are practicing some measures to evaluate the risk of pressure ulcer. As relationship between Braden score and nursing practice was significantly negative. It is expected that if nurses are given an opportunity to use the pressure ulcer risk assessment tools they can perform better for prevention of pressure ulcer.

Regarding the age, older adults had a fivefold increase in the development of a pressure ulcer in comparison to young adult.¹⁴ In old adult, there is diminished epidermal thickness, tissue elasticity and diminished sebaceous and sweat gland activity, cardiovascular changes results in decreased tissue perfusion, diminished sensory perceptions which leads susceptible to pressure ulcer.¹³ Thus, findings of this study are in line with the theoretical aspect.

Regarding the BMI, A study revealed that the incidence of pressure ulcers in the underweight, normal weight, obese, and extremely obese groups were 8.6%, 5.5%, 2.8%, and 9.9%, respectively.¹⁵ Extremely obese patients were about 2 times more likely to experience an ulcer than the normal weight patients. Therefore higher nursing care is required for the patients with high or low BMI in comparison to patients with normal BMI. In this study, 29% of the patients were under weight and 12.9% were extremely obese. Although there is no statistical significance between BMI and nursing practice and the direction is positive. Patient with sensory loss, impaired level of consciousness or paralysis with low Braden score cannot change the position independently. This prolonged pressure impedes blood flow, reducing nourishment of the skin and underlying tissues. A pressure ulcer may develop in a short period of time.¹³ Hence, good nursing practice is essential for the prevention of pressure ulcer.

Further, five domains of individual activity namely (1) skin assessment, (2) repositioning, (3) skin care, (4) support surface and (5) patient and care giver education were analyzed.

The first domain was assessment of skin which contained 2 statements. The maintenance of skin integrity is a key component in the prevention of pressure ulcer, for which, regular skin inspection should be carried out.¹⁶ In this domain, the first statement observed was "performance of head to toe skin assessment". The finding of this study was that skin assessment was done in 32.3% patients and second statement "skin inspection in each turning" was done only in 4.8% patients. Similar study done in German Hospitals where observation was made for 24 hours, showed skin inspection was done in 15.6 % patients.⁹ It showed that skin inspection is lower in advanced Hospitals also follow NPUAP guidelines. However, study conducted in Egypt showed, 64.6% nurses had performed daily skin

assessment which contradicts the current study findings.¹⁴

The second domain was repositioning and it contained 2 statements. It is usually recommended that the immobilized patient should be repositioned in every 2 hours or frequently.¹³ First statement in this domain was "frequent positioning i.e. 2 to 4 hourly" which was performed only in 11.3% patients. Study of Hobittalab, et al 2014 showed repositioning done in 40.6% patients.⁹ Above study were contradicted with the study done by Mwebaza et al that showed regular positioning done in 98.2% patient.¹⁷ Second statement for this domain was "head of bed elevation not more than 30°" which was done in 35.5% patients.

Third domain of this study was skin care and it contained 4 statements. The first statement of this domain was "minimization of skin exposure to moisture" which was done in 88.7% patient. This finding is consistent with the study of Hobiatalab et al which showed that minimized skin exposed to moisture was 98.8%.⁹ Second statement was "back care with application of moisturizing agent", which was performed only in 8.1% patients. Similar study conducted in German Hospitals was contradictory where skin was cleaned in 93.8% patients where as application of moisturizing agent was done in 62% patient which is a good practice.⁹ Third statement was "use of draw sheet for shifting the patient to minimize friction" it was performed in 9.7% of patients. This finding is contradictory with the study conducted in German Hospitals where skin protection during changing position and shifting the patient was 90.63%.⁹ Here minimizing the skin exposure to moisture is high in both studies but was contradictory in back care and in using draw sheet.

Fourth domain was "support surface" and it contained four statements. First statement was "use of pillow for back support" which was performed in 48.4% patients. Second statement was "use of pillow between knee and ankle" which was performed in 6.5% patients. Third statement was "use of air mattress". This study revealed use of air mattress was in 11.3% patients. Similar finding was also obtained from the study conducted in India by Kaur S, et al and Shahin et al.^{18,19} In Germany which were 8.5% and 12.2% respectively.⁹ However, the above mentioned study showed very low practice in comparison to the study conducted in Pakistan by Nasreen et al which was 44.1%.³ But this study was done using questionnaire method. Fourth statement was "use of heel support as appropriate". In this study it was done in 1.6% patients. Study done by Chaboyer et al. in Australia showed, heel was supported in 29% patients.²⁰ In contradictory to this study Hobiatalab et al. in German explained heel was supported in 50% patients.⁹ Use of heel support seems large variations in different studies.

Regarding the fifth domain, Education to the patient and care giver about pressure ulcer prevention is the key point for prevention of pressure ulcer. This domain consisted three statements. First statement was "encouragement for nutritional diet" which was done in 37.1% patients. Second statement was "encourage for adequate fluid intake" which was done in 24.2% patients. Third statement was "education on preventive measures and consequences of pressure ulcer" where 77.4 % patients and caregiver received education on preventive measures of pressure ulcer and its consequences. However, the study conducted in Germany showed only 1 out of 32 patients received information on pressure ulcer prevention.⁹ A study conducted by Nasreen et al showed that 36% nurses had given education to patient and care giver about pressure ulcer prevention.³ However, despite the limited number of nurses and more patient flow in context of Nepal, by using observational method, it was found that more nurses had given patient and caregiver education than that of the questionnaire method which was found to be beneficial for patient in knowing the consequences of pressure ulcer and helping themselves in preventive and curative activities.

The observation was included only for one shift i. e. 7 AM to 2 PM. Thus, the findings might be different if all the shifts (morning, evening and night) were included. The use of purposive sampling could have sampling bias but use of Braden scale score for the selection of patients strengthens the findings of the study.

Conclusions

Based on the findings of this study, good nursing practice for prevention of pressure ulcer in immobilized patients was limited. More than three-fourth patients received good nursing practice regarding minimizing moisture, smooth and wrinkle free bed linen and education on preventing pressure ulcer. Though skin care, skin assessment, and positioning are an integral part of the prevention of pressure ulcers, very few patients in our study received it suggesting that nursing practice needs to be improved for the prevention of pressure ulcers among immobilized patients.

Recommendations

Use of Braden scale for the assessment of risk of pressure ulcer is not common in the countries like Nepal. Despite the knowledge of using Braden scale the negative association between Braden score and nursing practice shows that nurses are prioritizing the nursing care to the needy people. Thus, it suggests that there is a need for the implementation of program to enhance the nurses' knowledge for risk assessment of pressure ulcer.

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