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Prevalence Of Pressure Ulcer in Orthopaedic Bedridden Patients with A Higher Braden Pressure Ulcer Score in A Tertiary Care Government Hospital in Jammu

Rajni Thapa[1], Dr. S. Victor Devasirvadam[2], Supriya[3]

[1,3]PhD (N) Scholar, AP SMVDCoN
[2]Faculty of Nursing, Desh Bhagat University

Abstract

Aims/Objectives:

with a higherIn this research, our primary objective was to determine the prevalence of pressure ulcers (PU) in bedridden patients with risk of higher Braden Pressure Ulcer scores who were admitted to the orthopaedic wards at the tertiary care government hospital in Jammu.

Methodology

To achieve this, we conducted a cross-sectional point prevalence study utilising the Braden Pressure Ulcer Risk Assessment Scale and the European Pressure Ulcer Advisory Panel (EPUAP) grading scale and data form. Our research sample consisted of 180 bedridden patients with higher Braden scores admitted to the orthopaedic ward of the selected facility. We monitored these patients using an observational checklist based on the established EPUAP minimal dataset form and grading scale. We conveniently selected patients who had moderate to severe Braden Pressure Ulcer Risk scores.

Result

Our findings revealed that 22.8% of the bedridden patients with moderate to high-risk Braden pressure ulcer scores developed pressure ulcers. Among the respondents, the majority (67.78%) were categorised as high risk, followed by severe risk (18.89%) and moderate risk (13.33%). Of those who developed pressure ulcers, 28 had Grade 1 ulcers and 12 had Grade 2 ulcers. The most common locations for these ulcers were the sacrum (40%), followed by the iliac region (35%), and the buttocks (25%). We did not observe any significant association between clinical variables and the incidence of pressure ulcers, except for skin turgor.

Conclusion: In conclusion, our study highlights the prevalence of pressure ulcers among bedridden patients in the orthopaedic ward of the Govt. Medical College and Hospital in Jammu. It is essential to exercise caution when treating orthopaedic patients who are at a higher risk of developing pressure ulcers due to prolonged inactivity, reliance on others for activities, and high Braden Pressure Ulcer Risk scores. Taking preventive measures is crucial to avoid the development of pressure ulcers in these patients, along with the implementation of evidence-based nursing practices to control the rate of pressure ulcers.

Keywords: bedridden patients, Braden scale, EPUAP, healthcare, orthopaedic, pressure ulcer.

1. Introduction

Pressure ulcers (PUs) are more common in skeletal areas because of the increased pressure and tissue deformation potential [1]. Although pressure ulcers are preventable, dealing with them costs enough [2]. The results of this research will provide healthcare professionals with the knowledge they need to effectively identify the severity grade and treat patients accordingly. By doing this, the management can emphasise the importance of improving PU risk estimation and prevention by implementing guideline recommendations and new PU treatment and prevention guidelines in addition to standard medical care given to bedridden patients and patients at risk.

2. Methodology

2.1 Study Design

In this research, we have employed a descriptive survey approach to investigate the occurrence and progression of pressure ulcers in bedridden patients admitted to the orthopaedic ward. As suggested by Walker (2005), a descriptive design is suitable for identifying and evaluating the presence, value, relevance, and frequency of certain phenomena. The study population consisted of patients who were admitted to the ward within 24 hours of the start of data collection and were at risk of developing pressure ulcers based on their moderate to high Braden Pressure Ulcer Risk scores. Initially, there were 250 patients in the ward who met these criteria. However, a subset of 70 patients was excluded from the analysis due to early transfer or discharge, unwillingness to participate, or pre-existing pressure ulcers. Therefore, the final sample size for analysis consisted of 180 patients. The data collected for this study included demographic factors, co-morbidities, mobility issues, skin integrity, length of stay, and the elements of the EPUAP minimal data set. These participants were followed up for a research period ranging from 11 to 15 days, during which daily assessments were conducted.

The orthopaedic departments of the hospital have an average inpatient department (IPD) of 350 (+/- 20) patients per month. From this population, all patients were screened for a moderate-to-high risk Braden score. We selected patients who met the criteria mentioned earlier and showed no signs of pressure ulcers at the time of admission. The total number of patients who participated in this inquiry was 180. It is well known that elderly individuals, those with limited mobility, and those confined to bed are more prone to developing pressure ulcers. These ulcers, also known as decubitus ulcers or bedsores, occur as a result of prolonged pressure on the skin. Factors such as friction, moisture, and shear force, which involve the pulling force on the skin, can contribute to the formation of bedsores [11].

Data Collection

The data collection period for this study took place from June 2022 to July 2022.

- **Tools of the Study**

Nancy Bergstron and Barbara Braden created the Braden Scale, which was verified in Brazil in 1987. It helps to assess the patient's overall health and PU risk, as well as select preventative and therapeutic PU measures. This scale is thought to make it possible to assess some variables linked to the development of PU. Its use by the evaluator is thought to facilitate a thorough review of the patient's condition [6]. Six subscales make up the scale: friction, shear, moisture, activity, mobility, and nutrition. Three domains—sensory perception, activity, and mobility—are medical predictors of patient exposure to sustained and high pressure. Moisture, nutrition, friction, and shear are the additional three variables that impact the

tissue's capacity to endure extreme pressure. Except for shear and friction, whose ranges are 1-3, each scale domain contains a defined quantitative definition of the patient's circumstances, varying from 1-4. Low risk is defined as having a risk rating between 15 and 16 points, moderate risk between 13 and 14 points, high risk between 10 and 12 points, and extremely high risk below 9 points [6–9].

EPUAP: The European Pressure Ulcer Advisory Panel Minimal Data Set form and grading criteria were used to collect information regarding the occurrence of pressure ulcers and their factors.

- **Association of PU with clinical variables**

The association between the incidence of pressure ulcers and clinical variables including co-morbidity, elevation of bed, incontinence, mobility, level of consciousness, duration of bedridden, skin turgor, and treatment modality was identified.

3. Statistical analysis plan

The investigation comprised patient profiles based on several clinical and demographic factors. Means and standard deviations were used to provide a descriptive analysis of quantitative data. Percentage, median, and range were used to convey ordinal data. The Chi-square test was utilised for comparisons and connections after the creation of cross tables. Statistical significance was defined as a p-value <0.05. SPSS 25.0 was used for the analysis.

4. Results

- **Demographics of the respondents**

The characteristics of the study's participants are shown in **Table 1** (Figures 1a–g).

Table 1. Demographic details of the respondents

Variables		Frequency	Percentage
Age	< 30	39	21.67
	31-40	43	23.89
	41-50	31	17.22
	51-60	19	10.56
	>60	48	26.67
Gender	Male	135	75.00
	Female	45	25.00
Habits	Smoking	21	11.67
	Alcohol	18	10.00
	Smoking and alcoholism	13	7.22
	Tobacco using	8	4.44
	None	120	66.67
Body Built	Ectomorph (long and lean)	137	76.11
	Endomorph (flat tissue)	43	23.89

There were 180 patients, and out of them, the majority of them (75%) were male and only 25% were female. Most of the respondents were more than 60 years old (26.67%), followed by 31 to 40 (23.89%), <30 (21.67%), 41 to 50 (17.22%), and 51 to 60 (10.56%). About their body build, most of them were

ectomorphs, or about 76.11%, whereas only 23.89% had an endomorph body type. Out of them, most of them neither smoke nor drink alcohol. Only 11.67% were smokers, 10% used to take alcohol, 7.22% were both alcoholics and smokers, and 4.44% used to take tobacco.

Table 2. Incidence of pressure ulcers along with grade and location

		f	%
Incidence	Yes	41	22.8
	No	139	77.2
Grade	Grade 1	28	70
	Grade 2	12	30
Location	Sacrum	16	40
	Iliac	14	35
	Buttock	10	25

Only 22.8% of the respondents developed pressure ulcers; out of them, 28 had ulcers of grade 1, and 12 had ulcers of grade 2. Most of them were at the sacrum (40%), followed by the iliac (35%), and buttock (25%).

- **Risk assessment by the Braden pressure ulcer risk assessment scale**

Table 3. Risk assessment of the respondents by the Braden Pressure Ulcer Risk Assessment Scale

Braden scale	Frequency	Percent
Less than 9 (severe risk)	34.00	18.89%
10 to 12 (high risk)	122.00	67.78%
13 to 14 (moderate risk)	24.00	13.33%
15 to 18 (mild risk)	0	0

Most of the respondents (67.78%) scored between 10 and 12, indicating a high risk of developing pressure ulcers. 18.89% of them were at severe risk as they scored less than 9, also developing pressure ulcers, whereas 13.33% scored between 13 and 14, indicating a moderate risk of pressure ulcers.

- **Clinical variables:** The association between the incidence of pressure ulcers and clinical variables including co-morbidity, elevation of bed, incontinence, mobility, level of consciousness, duration of bedridden, skin turgor, and treatment modality is represented in Table 4 (Figure 1a–h).

Table 4. Association between clinical variables and the incidence of pressure ulcers in bedridden patients

		Incidence (Yes/No)		Chi-square	Significance
		Yes	No		
Co-Morbidity	Diabetes	3	11	0.334	0.953
	Hypertension	4	13		
	Diabetes and hypertension	3	7		

	Other	31	108		
	Completely flat	7	34		
	15˚	14	49		
Elevation of the Bed	30˚	17	43	2.752	0.60
	45˚	2	9		
	60˚	1	4		
	Urinary incontinence	19	54		
Incontinence	Faecal incontinence	0	0	0.937	0.626
	Both	0	0		
	None	22	85		
	Completely limited	22	68		
Mobility	Very limited	16	66	2.895	0.408
	Slightly limited	2	4		
	No limitation	1	1		
	Conscious (GCS: 12–15)	36	128		
Level of Consciousness	Semi-consciousness (GCS: 8–11)	5	10	0.574	0.751
	Unconsciousness (GCS: 3-7)	0	1		
	0-6 days	24	80		
Duration of Bed Riddeness	6-12 days	13	50	0.775	0.679
	More than 12 days	4	2		
	Good	21	82		
Skin Turgor	Fair	16	54	9.098	0.011
	Poor	4	3		
	Medical	9	41		
Treatment Modality	Surgical	28	90	4.02	0.134
	Rehabilitation	4	8		

Most participants who had PUs did not show any significant association with clinical variables. The χ^2 test on the relation between co-morbidity and incidence of the pressure ulcer category showed a significant association between pressure ulcers and skin turgor ($P<0.05$). Similarly, no significant association between elevation of bed, incontinence, mobility, level of consciousness, duration of being bedridden, or treatment modality was observed with the prevalence of PUs ($P > 0.05$).

Discussion

The purpose of this research was to determine the prevalence of pressure ulcers and any possible clinical factors leading to the development of PU among patients admitted to the orthopaedic ward of a tertiary hospital in Jammu. Prevalence studies are crucial because they enable us to evaluate the severity of the illness and its accompanying morbidities in the community. In the present study, the findings revealed a

22.8% incidence of pressure ulcers in bedridden patients with a moderate-to-high-risk Braden pressure ulcer score. The Braden Risk Assessment Score showed most of the patients were at high risk (67.78%), followed by severe risk (18.89%) and moderate risk (13.33%). The study's findings showed that only 22.8% of the respondents developed pressure ulcers, out of which 28 had Grade 1 and 12 had Grade 2 ulcers. The Braden scale has shown superior validity and reliability compared to other commonly used measures for systematically evaluating the risk of pressure ulcers, particularly in populations with the greatest frequency of such ulcers [12].

Most pressure ulcers were in the sacrum (40%), followed by the iliac (35%), and buttock (25%). No association between clinical variables and the incidence of PUs ($P<0.05$) was observed except for skin turgor and comorbidity ($P<0.05$). Similar results were found in research conducted in Jordan, where the prevalence of PU was found to be less (16 percent) in comparison with the PU prevalence found in our study, while the study shared similar demographics with the present study [9]. The findings of Coyer et al. revealed the prevalence of pressure ulcers to be about 11.5%, while the prevalence of PUs was greater for stage 1 [13]. The reported prevalence rates ranged from 3.4% in Dutch hospitals to as high as 28% in certain Indonesian hospitals, according to the results. The overall prevalence rate of PUs in intensive care units (ICUs) was 24.3%, which was mostly consistent with studies from other countries [14, 15].

Results from this research and others pointed to the possibility that the development of PUs in an individual is worsened by the accumulation of numerous risk factors rather than a single one [13]. Nevertheless, there was no association found in the present study between clinical factors such as bed elevation, incontinence, mobility, degree of awareness, length of bed rest, and treatment method with the occurrence of PUs ($P > 0.05$). Similar research carried out in Korea in 2017 revealed a link between an increase in inpatient days and PUs development [16]; a study carried out in the United States also revealed a link between a rise in inpatient days and pressure ulcer development (p-value <0.05) [17].

Among pressure ulcer risk assessment scales, Pancorbo-Hidalgo et al. demonstrated that the Braden score gives the greatest sensitivity and specificity ratios as well as the best risk estimate [18]. The most commonly used routine risk assessment, the Braden score, showed no clear risk factor in our research despite being extensively utilized. As in much other research, it was shown that characteristics including immobility, mechanical ventilation, incontinence, and post-operative state [19, 20] were also linked to an increased risk of developing pressure ulcers.

The evaluation of wound healing was performed with the Pressure Ulcer Scale for Healing (PUSH). The findings of the study suggested that the healing rate of pressure injuries present at admission (POA-PIs) is notably limited. Furthermore, the only established prognostic factor for POA-PIs is the extent of wound depth [21].

According to several studies, the sacral area was the site of pressure ulcers most often, followed by the gluteal region [22, 23]. According to other findings, the majority of them were at the sacrum (40%), followed by the iliac (35%), and buttock (25%). Grade I ulcers were found to be more common (15.6%) [24].

Future studies are needed to confirm the low prevalence rates found in this study and to identify the major clinical variable responsible for the occurrence of pressure ulcers. Nevertheless, this study has brought forth serious concerns related to pressure ulcers, and thus it is an important healthcare and financial challenge to the Indian healthcare community. Thus, the use of health resources should be planned and used appropriately to avoid PUs [25, 26].

The limitations of this study were that it just gives a snapshot view of the problem of pressure ulcers at a given point in time. Also, the sample size considered was small, and the study was confined to only one hospital; hence, the results cannot be generalised for the overall state or country.

Conclusion

In this study conducted at the tertiary care government hospital in Jammu, we examined the prevalence of pressure ulcers among bedridden patients in the orthopaedic ward. The findings revealed that 22.8% of the participants developed pressure ulcers, with the majority exhibiting grade 1 PU, followed by grade 2. This high incidence rate of pressure ulcers can be attributed to a lack of adherence to evidence-based preventive measures. Additionally, the low nurse staffing level and poor nursing skills in the facility are contributing factors, as they place a significant burden on the nursing staff.

Based on our research, we recommend that bedridden patients be regularly screened for pressure ulcer risk using validated scales and implement evidence-based preventive practices. Furthermore, special attention should be given to this group of patients by adjusting the nurse-patient ratio. By implementing these measures, we can effectively reduce the occurrence of pressure ulcers and improve patient outcomes. Also, the management should organise education programmes for the training of health care personnel regarding the prevention of pressure ulcers.

This study sheds light on the pressing issue of pressure ulcers within the Indian healthcare sector. Not only do these ulcers pose a significant medical concern, but they also have a financial impact on healthcare facilities. Therefore, it is crucial for healthcare providers and policymakers to address this issue promptly and implement preventive strategies to alleviate the burden on patients and healthcare resources.

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