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ORIGINAL ARTICLE

Prevalence of Pressure Ulcers among patients in Ibn e Sina Hospital

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ABSTRACT

Background: Pressure is a localized injury to the skin and underlying tissue usually over a bony prominence, as a result of pressure, or pressure contributing to shear.

Objective: The main objective was to determine the prevalence of pressure ulcers in the patients of Ibn e Sina hospital Multan and to determine the risk factors contributing to pressure ulcers by using Braden Scale.

Methodology: It was a cross-sectional observational study conducted on 246 patients of Ibn e Sina hospital Multan. During the 6 months of the study, patients were interviewed regarding their demographics and risk factors for pressure ulcers according to the Braden scale. Spss21 was used to analyze the data.

Results: Out of 246 patients, 74.8% of male patients had pressure ulcers. The patients were from 25 to 85 years old. The pressure ulcers were more frequent among the 45 to 65 years age group (i.e., 44.7%) and married patients (95.5%). Among 246 patients only 4.5% patients were at extra high risk and most of the patients were at low risk (69.5%) by using the Braden scale. This data will help physicians, researchers, and policymakers in Pakistan and other nations advocate for the needs of pressure ulcer patients.

Conclusion: According to this study pressure ulcers were more frequent in male married patients of the middle age group. Most of the patients were at low risk of developing pressure ulcers on the Braden Scale.

Keywords: Pressure ulcer PU, Pressure sores, Pressure Injuries, Prevalence, Risk factors, Braden Scale, Braden score, Hospitals, Intensive care units

INTRODUCTION

Shear, caused by pressure, or pressure leading to shear, is localized damage to the skin and subcutaneous tissues typically over a bony eminence [1]. The cause of pressure ulcers is pressure on soft tissue that entirely or partially obstructs the flow of blood to the soft tissue. Shear can strain the blood vessels that supply the skin. People who are unable to move around, especially those who are regularly in a wheelchair or on prolonged bed rest, are more likely to develop pressure ulcers [2]. Location and the extent of involvement are frequently used to describe pressure injuries. Up to 70% of all pressure injuries occur in the hip and buttock area, and most frequently at the sacral sites, trochanteric, and ischial tuberosity. The majority of pressure injuries occur in the pretibial regions, patellar, malleolar, and heel, which together make up 15–25% of all pressure injuries in the lower extremities [3]. The constant pressure that is high enough to significantly reduce the regional blood supply to soft tissues for a prolonged period causes pressure injuries. Although tissues may survive extremely high pressures for short periods, sustained exposure to pressures that are only slightly higher than capillary filling pressure starts a downward slope that leads to cellular destruction and ulceration [4,5]. Microcirculatory blockage and subsequent ischemia are brought on by friction, shear forces, and pressure. This causes inflammation and tissue anoxia. Necrosis, cell death, and ulceration result from tissue anoxia. Because of its greater requirement for oxygen and greater metabolic demands, muscle tissue is injured preceding skin and underlying tissue among the numerous structures at risk for mortality from pressure [6, 7]. Patients in acute and long-term care frequently sustain pressure injuries. Although it has been predicted that there are one million pressure injuries in the United States, there is still little conclusive knowledge regarding the epidemiological and historical background of this condition. Unfortunately, methodological problems and inconsistent descriptions of the lesions have plagued investigations to this point [8, 9]. According to reports, hospitalized patients' pressure injury occurrences range between 2.7% - 29%, and their prevalence is from 3.5% to 69% [10, 11]. According to a 41% prevalence, and a 33% incidence, patients in intensive care units are more likely to have pressure injuries [11, 12]. In our country, there is no reporting of the incidence of pressure ulcers, and their prevalence along its associated risk factors, in hospital ICU patients. To comprehend the association between the development of pressure ulcers and Braden scale scores, this study was undertaken among hospitalized patients of Ibn e Sina hospital Multan. The study's objectives included identifying which demographic and clinical factors are effective at predicting PI risk as well as assessing the probabilities of each of the subscales of the Braden scale.

MATERIALS & METHODS

Research Design: A Cross-sectional study was conducted.

Population: Hospitalized patients of Ibn e Sina hospital Multan were included in the study.

Sampling Technique: Convenience sampling was used for data collection.

Sample size: 246 was the sample size of this study.

Development of the instrument: The Braden scale is most frequently employed with adult patients. Six subscales make up this scale: sensory perception, skin wetness, mobility, activity, nutrition state, and friction/shear. The five subscales' items were graded on a scale from 1 to 4. The fraction/shear subscale's items had scores ranging from 1 to 3. Scores varied from 6 to 23, in total. A lower Braden grade indicates an increased chance of getting a pressure ulcer.

Validity and Reliability: The Braden Rating Scale is a valid and dependable tool for assessing ulcer risk. Sensitivity and specificity have varied between 61% and 100% at the best Braden Scale cut-off values [13].

Data collection procedure: Data was collected after approval from the institutional ethics review committee. Consent was taken from the hospitalized patients. The Braden-Scale questionnaire was distributed among all patients and filled by a researcher by asking a question. **Data Analysis Procedure**: SPSS V 21 was used to analyze the data. Descriptive statistics of the data were computed. Using the mean and standard deviation for continuous data and the number and percentage for categorical variables, patient characteristics were described. Pearson correlations were

then employed. To compare continuous variables, t-tests were utilized. In the bivariate analysis, variables significant at P values.05 were used to complete the logistic regression modeling.

RESULTS

The total sample of the study involved 246 hospitalized patients. 74.8% of male patients and 25.2% of female patients were included in this study. The result showed that middle-aged patients (45-65) were more affected than lower-aged or old-aged patients. The percentage of the lower-aged patients (25-45) was 16.3%, middle-aged patients (45-65) 44.7%, and old-aged patients (65-85) 39.0%. Frequencies in marital status showed that married patients were more affected than unmarried patients. The percentage of pressure ulcers in married patients was 95.5% and in unmarried patients was 4.5%. The results of this study showed that 69.5% of patients were on a low-risk scale for developing pressure ulcers. 52.4% of patients of Ibn e Sina hospital had no limitations of sensory perception, 36.6% of patients walked occasionally, 80.9% had no apparent problems with friction and shear, 45.9% patients had lightly limited mobility, 43.5% had adequate nutrition, and 48% were rarely moist (table 1). When variables were correlated, it was discovered that age, gender, and marital status had a significant correlation with patients who had pressure ulcers while having a negative association with braden scoring and risk scale. The risks scale and braden score had a negative correlation among individuals who had developed PU, indicating that fewer individuals had high risk and a lower braden score, implying that patients with PU were significantly less numerous than those who had not (table 2).

Table 1: Frequency and percentage of scores of Braden subscales for pressure ulcers in hospitalized patients

Braden Subscales	Variable	Frequency	Percent
Gender	Male	184	74.8
	Female	62	25.2
	Total	246	100.0
Age Groups	25-45	40	16.3
	45-65	110	44.7
	65-85	96	39.0
	Total	246	100.0
Marital Status	Married	235	95.5
	Unmarried	11	4.5
	Total	246	100.0
Sensory Perception	Completely limited	12	4.9
	Very limited	33	13.4
	Slightly limited	72	29.3
	No limitation	129	52.4
	Total	246	100.0
Moisture	Constantly moist	3	1.2
	Very moist	22	8.9
	Occasionally moist	103	41.9
	Rarely moist	118	48.0
	Total	246	100.0
Activity	Bedfast	78	31.7
	Confined to chair	54	22.0
	Walks occasionally	90	36.6
	Walks frequently	24	9.8
	Total	246	100.0
Mobility	Completely immobile	36	14.6
	Very limited	82	33.3
	Lightly limited	113	45.9
	No limitation	15	6.1
	Total	246	100.0
Nutrition	Very poor	33	13.4
	Probably inadequate	82	33.3
	Adequate	107	43.5
	Excellent	24	9.8
	Total	246	100.0
Shear and friction	Problem	8	3.3
	Potential problem	39	15.9
	No apparent problem	199	80.9
	Total	246	100.0
Risk of Pressure ulcer development	Extra high risk (0-9)	11	4.5
	High risk (10-12)	30	12.2
	Medium risk (13-14)	34	13.8
	Low risk (15-16)	171	69.5
	Total	246	100.0

The results of t test also showed that there were significant differences between braden score and risk factors of pressure ulcers in patients who had and hadn't developed PU (table 3). The outcome also demonstrated that gender and age are not associated with the occurrence of pressure ulcers and that there are substantial differences between the braden subdimensions and their scores in terms of their association with the likelihood of developing pressure ulcers (table 4).

Table 2: Correlation of variables with Braden scale scores

Variables	Gender	Age	Marital status	Total score	Risk scale	PU developed
Gender	1	.170**	-.080	-.303**	-.300**	.293**
		.007	.210	.000	.000	.000
Age	.170**	1	-.375**	-.188**	-.185**	.118
	.007		.000	.003	.004	.064
Marital status	-.080	-.375**	1	-.014	-.007	.062
	.210	.000		.827	.910	.336
Total score	-.303**	-.188**	-.014	1	.876**	-.748**
	.000	.003	.827		.000	.000
Risk scale	-.300**	-.185**	-.007	.876**	1	-.898**
	.000	.004	.910	.000		.000
PU developed	.293**	.118	.062	-.748**	-.898**	1
	.000	.064	.336	.000	.000	

Correlation is significant at the 0.01 level (2-tailed).**

Table 3: Difference in t score for risk factors of pressure ulcers in patients who did or did not develop PU

Variables	Mean±SD	T score	P value
Sensory perception	3.29±.878	14.669	.008
Moisture	3.37±.697	6.344	.002
Activity	2.24±1.009	9.510	.003
Mobility	2.43±.814	15.129	.008
Nutrition	2.50±.846	12.065	.001
Friction and shear	2.78±.489	18.011	.009
Total score	16.61±3.801	17.580	.008
Risk scale	3.48±.875	11.813	.001

Table 4: Binary logistic regression for the occurrence of pressure ulcers in hospitalized patients

Variables	Mean±SD	Odds Ratio	P value
Age (years)	55± 0.59	1.168	.221
Gender	-	1.054	.442
Sensory perception	3.29±.878	1.359	.043
Moisture	3.37±.697	.532	.027
Activity	2.24±1.009	1.276	.018
Mobility	2.43±.814	1.436	.038
Nutrition	2.50±.846	.473	.019
Friction and shear	2.78±.489	1.156	.001
Total score	16.61±3.801	.531	.008
Risk scale	3.48±.875	.719	.002

DISCUSSION

The main objective of this article was to detail the risk factors for hospitalized patients developing PU. Identifying the key risk factors and their impact on the susceptibility of hospitalized patients to develop pressure ulcers was of critical importance for the prevention of pressure ulcers. To improve the accuracy of the Braden scale for predicting the onset of pressure ulcers, Brett D. McLarney et al. researched patients in intensive care units who tested positive for COVID-19. The findings of their investigation revealed that 20 male patients (54%) had a higher percentage of pressure ulcers developed than 17 female patients (46%). In comparison to other age groups, patients aged 57 to 68 had a higher percentage of pressure ulcers [14]. The results of our study showed that 74.8% of male patients and 25.2% of female patients were included in this study. The result showed that middle-aged patients (45-65) were more affected than lower-aged or old-aged patients. Ellene Lim et al. conducted a different study to evaluate the risks of pressure sores in adult patients by using Braden subscales. Age and race were found to be statistically insignificant determinants of PI development. A cut-off score of 3 was established for the Sensory Perceptions subscale, with sensitivity values of 0.46 and 0.81 for specificity. The optimal cut-off score was calculated to be 2, which results in a specificity level of 0.84 and a sensitivity level of 0.46 for the Mobility subscale [15]. M. Kakakhel et al. did a study on paediatric urology patients to investigate if typical saline or honey aided in the cure of wounds and found that honey may be utilized safely and efficiently for the control of post-infections at the surgical sites as opposed to standard saline-soaked bandages[16]. Sameen et al. investigated the relationship of anaemia with ulcers in diabetes patients and its

bearing on clinical outcomes in a hospital with tertiary care. The study's findings revealed that poor wound healing was more likely in DFU patients who had anemia, implying that if it is recognized and treated immediately, it can have a good impact on healing [17]. The results of our study showed that the patients who had a score of less than 3 on the sensory perception sub-scale of the Braden scale, means that they had lost their sensory perception and were unable to feel any sense. In this study, the percentage of patients who had completely limited sensory perception was 4.9 %, very limited was 13.4%, slightly limited was 29.3%, & no limitations of sensory perception were 52.4%. The percentage of activity in different pressure ulcer patients was also documented. 31.7% of patients had bedfast activity, 22% of patients were confined to chairs, patients who walked occasionally were of 36.6% and who walked frequently were of 9.8%. Patients who walked frequently had the least percentage. Sedigheh Iranmanesh et al. researched to determine the association between the Braden scale rating and the development of pressure ulcers in patients admitted to the trauma critical care unit. Their study's friction and shear Braden scale scores were (r = 0582, P 001) [18]. In our study, the percentage of friction and shear in different pressure ulcer patients showed that 3.3% of patients had a problem with friction and shear, 15.9% of patients had potential problems, and 80.9% had no apparent problems with friction and shear. The risk scale shows that 4.5% of patients were at extra high risk, 12.2% of patients were at high risk, 13.8% were at medium risk, and 69.5% were on a low-risk scale. The findings of this research are consistent with those of another study by Reyhani et al. showing only a decline in mobility (power to shift and adjust body posture) and sensory perceptions (capacity to react appropriately to pressure-related distress) can induce pressure ulcers [15]. To determine the prevalence of pressure injuries in a neurology critical care unit, Fife et al. undertook a study. According to their research, the development of pressure ulcers was significantly and specifically influenced by underweight status [19]. According to Mairin Schott et al. research, malnutrition slows the healing process. The results of the Braden subscale analysis revealed that conditions including dysphagia, poor diet acceptability, and limited mobility are all highly associated with an elevated risk of developing pressure injuries [20]. In a tertiary care hospital, Jamila Farid et al. performed a study to determine the prevalence and predictability of pressure ulcers in hospitalized stroke patients. They found that the study group had poor hygiene (6.7%), was undernourished (11.7%), and did not use preventive mattresses (79.2%). Pressure ulcer risk factors included not being positioned (6.7%) and not being aware (10%) [21]. In our study, the frequencies of mobility in different pressure ulcer patients showed that the patient who had a score less than 3 means that they were unable to move or to do any activity and didn't change their positions after every 2 hours. In accordance, they were determined to need repositioning. Complete immobile patients were 14.6%, very limited mobile patients were 33.3%, lightly limited mobile patients were 45.9%, and no limited mobility patients were 6.1%. Patients who had very poor nutrition mean that they had less than 3 nutrition subscales on the Braden scale, which showed they were unable to take the proper diet. The percentage of nutrition in different pressure ulcer patients showed that 13.4% had very poor nutrition, 33.3% had probably inadequate nutrition, 43.5% had adequate nutrition, and 9.8% had excellent nutrition. According to the findings of the study done by Kayser, Susan A., et al. individuals who experienced urinary incontinence were most likely to get pressure ulcers and dermatitis[22]. The results of our study demonstrate that the patients who had a score of less than 3 or more than 2 on the moisture subscale mean the patients were constantly moist and the skin was always slightly wet. 1.2% of patients were constantly moist, 8.9% of patients were very moist, 41.9% were occasionally moist, and 48% were rarely moist. This study can help medical practitioners with different levels of experience and judgment reliably identify individuals who are at risk for getting bed sores and determine how serious the risk is. This data will also help physicians, researchers, and policymakers in Pakistan and other nations advocate for the needs of pressure ulcer patients.

CONCLUSION

According to this study, the Ibn e Sina hospital in Multan had a low risk of developing pressure ulcers. Patients were at low risk of developing pressure ulcers because risk factors like sensory perception, moisture, activity limitation, mobility, nutrition, friction, and shear were less common among them. According to the study's findings, the risk variables indicated above are associated with the prevalence of pressure ulcers.

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REFERENCE:

1. Baranoski S, Ayello EA. Wound care essentials: Practice principles: Lippincott Williams & Wilkins; 2008.
2. McInnes E, Jammali-Blasi A, Bell-Syer SE, Dumville JC, Middleton V, Cullum N. Support surfaces for pressure ulcer prevention. The Cochrane database of systematic reviews. 2015(9):CD001735.
3. McEwen DR. Intraoperative positioning of surgical patients. AORN journal. 1996;63(6):1058-79.
4. Gefen A. Reswick and Rogers pressure-time curve for pressure ulcer risk. Part 1. Nursing Standard (through 2013). 2009;23(45):64.
5. Gefen A. Reswick and Rogers pressure-time curve for pressure ulcer risk. Part 2. Nursing Standard (through 2013). 2009;23(46):40.
6. Le KM, Madsen BL, Barth PW, Ksander GA, Angell JB, Vistnes LM. An in-depth look at pressure sores using monolithic silicon pressure sensors. Plastic and reconstructive surgery. 1984;74(6):745-56.
7. Witkowski JA, Parish LC. Histopathology of the decubitus ulcer. Journal of the American Academy of Dermatology. 1982;6(6):1014-21.
8. Berlowitz D. Incidence and prevalence of pressure ulcers. Pressure ulcers in the aging population: Springer; 2014. p. 19-26.
9. Brandeis GH, Morris JN, Nash DJ, Lipsitz LA. The epidemiology and natural history of pressure ulcers in elderly nursing home residents. Jama. 1990;264(22):2905-9.
10. Fogerty M, Guy J, Barbul A, Nanney LB, Abumrad NN. African Americans show an increased risk for pressure ulcers: a retrospective analysis of acute care hospitals in America. Wound repair and regeneration. 2009;17(5):678-84.
11. Manley M. Incidence, contributory factors, and costs of pressure sores. South African Medical Journal. 1978;53(6):217-22.
12. Robnett MK. The incidence of skin breakdown in a surgical intensive care unit. Journal of Nursing Care Quality. 1986;1(1):77-81.
13. Kring DL. Reliability and Validity of the Braden Scale for Predicting Pressure Ulcer Risk. Journal of Wound Ostomy & Continence Nursing. 2007;34(4):399-406.
14. McLarney BD, Le Guen CL, Huang S, Ramsey F, Soans R, Hsu S. Predictors of COVID-19 disease severity augment the Braden scale in the prediction of pressure ulcer development among COVID-19-positive intensive care unit patients: A case-control study. J Am Acad Dermatol. 2022;87(3):711-4.
15. Lim E, Mordiffi Z, Chew HSJ, Lopez V. Using the Braden subscales to assess the risk of pressure injuries in adult patients: A retrospective case-control study. Int Wound J. 2019;16(3):665-73.
16 Kakakhel MK, Khan MK, Ullah S, Asif M, Shaikh A, . A. Comparison of Honey Versus Normal Saline in the Management of Post-Operative Infected Wounds in Pediatric Urology Patients. 2022;16(9):554–6.
17 Sameen D-E-, Shahzad M, Khan S, Khan KH, Azeem SMI, Khan Z. Exploring Association of Anemia with Diabetic Foot Ulcer and its Impact on Disease Outcome in a Tertiary Care Hospital. 2022;16(12):406–9.
18. Iranmanesh S, Rafiei H, Sabzevari S. Relationship between Braden scale score and pressure ulcer development in patients admitted in trauma intensive care unit. Int Wound J. 2012;9(3):248-52.
19. Fife C, Otto G, Capsuto EG, Brandt K, Lyssy K, Murphy K, et al. Incidence of pressure ulcers in a neurologic intensive care unit. Crit Care Med. 2001;29(2):283-90.
20. Schott M, Golin A, de Jesus SR, Alves BP, Dachi L, Cassol MC, et al. Dysphagia, Immobility, and Diet Acceptance: Main Factors Associated with Increased Risk of Pressure Injury in Patients Hospitalized after Stroke. Adv Skin Wound Care. 2020;33(10):527-32.
21. Farid J, Amin R, Sheikh MA, Irfan M, AlRuwaili R, Alruwaili M, et al. Prevalence and prediction of pressure ulcers in admitted stroke patients in a tertiary care hospital. J Tissue Viability. 2022;31(4):768-75.
22. Kayser SA, Phipps L, VanGilder CA, Lachenbruch C. Examining Prevalence and Risk Factors of Incontinence-Associated Dermatitis Using the International Pressure Ulcer Prevalence Survey. J Wound Ostomy Continence Nurs. 2019;46(4):285-90.