



A Comparative Study To Assess The Risk of Pressure Ulcer Between Medical And Surgical Unit of Hospitalized Patients in, S.s.h, Bhu, Varanasi.

KEYWORDS

Pressure ulcers, risk assessment scales, systematic review, meta-analysis, clinical practice.

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ABSTRACT

Background: The approach of this study is descriptive and comparative research. The population comprised of 60 hospitalized patients from Medical and Surgical units of S.S. Hospital, BHU. **Methodology:** Convenient and purposive sample technique was used to select the sample. The independent variable were the patients hospitalized in Medical and Surgical ward their age, sex, education, religion, type of family, monthly income of family and marital status. **Dependent variable** was Braden pressure ulcer assessment score and knowledge score regarding pressure ulcer care during hospitalization. **Observational scale** and a structure interview schedule were developed for data collection. After conducting the pilot study the main was carried out. In main study Braden Scale was applied to assess risk of pressure ulcer in Medical and Surgical ward and knowledge score to identify the knowledge of caregiver. **Result:** The finding of Braden assessment scale mean in Medical ward is 15.43 (51.43 %) that was lower than the mean value of Braden assessment scale in Surgical ward 18.8 (62.67 %) the result was showing that Medical ward have more risk of pressure ulcer than surgical ward. The 't' test value computed for the Braden assessment scale $t = 8.21^{**}$, $p < 0.001$ showed highly significant. The finding of the post test scores indicate that majority of 15 (50 %) have average knowledge, 12 (40 %) have good knowledge, 3 (10 %) have poor knowledge. **Conclusion:** The above finding suggest that Medical ward patient have more risk of pressure ulcer than Surgical ward. There was significant association b/w knowledge score and some demographic variable like educational status, income of the family, while demographic variables like age, sex, marital status and type of family loses their relationship.

INTRODUCTION

Pressure ulcers are a type of injury that breaks down the skin and underlying tissue. They are caused when an area of skin is placed under pressure. They are also sometimes known as "bedsores" or "pressure sores". Pressure ulcers can range in severity from patches of discoloured skin to open wounds that expose the underlying bone or muscle. Pressure ulcers can develop when a large amount of pressure is applied to an area of skin over a short period of time.¹ They can also occur when less pressure is applied over a longer period of time. The extra pressure disrupts the flow of blood through the skin. Without a blood supply, the affected skin becomes starved of oxygen and nutrients and begins to break down, leading to an ulcer forming. Pressure ulcers tend to affect people with health conditions that make it difficult to move, especially those confined to lying in a bed or sitting for prolonged periods of time.² Conditions that affect the flow of blood through the body, such as type 2 diabetes, can also make a person more vulnerable to pressure ulcers. Globally, as of 2010, pressure ulcers resulted in about 43,000 deaths.³ Each year, more than 2.5 million people in the United States develop pressure ulcers.⁴ In acute care settings in the United States, the incidence of bedsores is 0.4% to 38%; within long-term care it is 2.2% to 23.9%, and in home care, it is 0% to 17%. Similarly, there is wide variation in prevalence: 10% to 18% in acute care, 2.3% to 28% in long-term care, and 0% to 29% in home care. There is a much higher rate of bedsores in intensive care units because of immunocompromised individuals, with 8% to 40% of ICU patients developing bedsores.⁵ However, pressure ulcer prevalence is highly dependent on the methodology used to collect the data. Using the European Pressure Ulcer Advisory Panel (EPUAP) methodology there are similar figures for pressure ulcers in acute hospital patients. There are differences across countries, but using this methodology pressure ulcer prevalence in Europe was consistently high, from 8.3%

(Italy) to 22.9% (Sweden). A recent study in Jordan also showed a figure in this range.⁶

The prevalence of pressure ulcers in hospital settings is high, but improvements are being made. According to the 2010 International Pressure Ulcer Prevalence (IPUP) Survey conducted in Canada, there was a significant decrease in the overall facility-acquired prevalence of pressure ulcers from 2009-2010.⁷ Ulcers were most commonly identified at the sacral/coccyx ulcer location; however, heel ulcers were the most common facility-acquired location in the survey. People over 70 years old are particularly vulnerable to pressure ulcers due to a combination of factors, such as: Two out of every three cases of pressure ulcers develop in people who are 70 years old or more.⁸

Pressure ulcers are likely caused by three different tissue forces:

1. Pressure or the compression of tissues and/or destruction of muscle cells. In most cases, this compression is caused by the force of bone against a surface, as when a patient remains in a single decubitus position for a lengthy period. After an extended amount of time with decreased tissue perfusion, ischemia occurs and can lead to tissue necrosis if left untreated. Pressure can also be exerted by external devices, such as medical devices, braces, wheelchairs, etc.
2. Shearing, a force created when the skin of a patient stays in one place as the deep fascia and skeletal muscle slide down with gravity, can also cause the pinching off of blood vessels which may lead to ischemia and tissue necrosis. Friction is related to shear but is considered less important in causing pressure ulcers.^{9,10}
3. Microclimate, the temperature and moisture of the skin

in contact with the surface of the bed or wheelchair. Moisture on the skin causes the skin to lose the dry outer layer and reduces the tolerance of the skin for pressure and shear.¹¹ The situation may be aggravated by other conditions such as excess moisture from incontinence, perspiration, or exudates. Over time, this excess moisture may cause the bonds between epithelial cells to weaken. Thus resulting in the maceration of the epidermis. Temperature is also a very important factor. The cutaneous metabolic demand rises by 13% for every 1°C rise in cutaneous temperature. When supply can't meet demand, ischemia then occurs.¹²

There are currently two major theories about the development of pressure ulcers. The first and most accepted is the deep tissue injury theory which claims that the ulcers begin at the deepest level, around the bone, and move outward until they reach the epidermis. The second, less popular theory is the top-to-bottom model which says that skin first begins to deteriorate at the surface and then proceeds inward.^{13,14}

Risk Assessment Method –

Pressure ulcer assessment includes determining a person's risk for pressure ulcer development and inspection of skin condition, particularly over bony prominences, beneath clothing and under devices.

For all inpatients, assess risk for pressure ulcer development at time of admission using a validated risk assessment tool. The literature and work group recommend the Braden Scale for Predicting Pressure Sore Risk® (Braden Scale) and the Braden Q Scale®, although there are several tools available to assess pressure ulcer risk. Other tools available include the Norton Scale and Water low Scale [M].²³

The Braden Scale for Predicting Pressure Sore Risk (Braden Scale) is the most commonly used validated tool for predicting patients at risk for pressure ulcer development. Although the sensitivity and specificity for predicting pressure ulcer risk are high for the Braden Scale, it serves as an adjunct to clinical judgment regarding each individual. It is important for the health care team to use the Braden score as a guideline in planning interventions aimed at prevention .

The Braden Scale was developed and tested for the adult population. The Braden Q is a modified Braden Scale for use in paediatric patients up to age 18 years. The Braden Q consists of seven subscales: mobility, activity, sensory perception, skin moisture, friction and shear, nutrition and tissue perfusion/oxygenation. The Braden Q was tested for validity in a cohort study with children ages 21 days to 8 years in three sites.¹⁵

It presents a broad, general explanation of the relationship between the concepts of the research study, based on an existing theory. To construct a theoretical framework, an existing theory is used to establish the relationship between the study concepts.

ANALYSIS

SECTION 1 – DEMOGRAPHIC VARIABLE OF THE PATIENT IN MEDICAL AND SURGICAL WARD

The section deals with data pertaining to demographic variables of patients in medical and surgical wards. It is analyzed and presented in the terms of frequency and per-

centage distribution. The total number of subjects selected for the study was sixty, with age group of 20 to 70 years. Male were 58.33% and female were 41.67%. the illiterate number of patients were 19, with primary education is 19, secondary education was 20, graduate and post graduates were 7. All the 60 patients were Hindu, 25 of them were from nuclear family and 35 of them from joint family. Patient with low income group is 4, lower middle is 39, upper middle is 12 and upper income group have 5 patients. Marital status of the patient Unmarried were 2, married were 55, widow/widower were 3, 23 number of patients were having their weight with in 40-50 kg, 21 were 51-60kg, 12 were in 60-70 kg and 4 patients were having their age more than 70 kg.

SECTION 2: ASSESSING THE RISK OF PRESSURE ULCER IN MEDICAL AND SURGICAL WARD

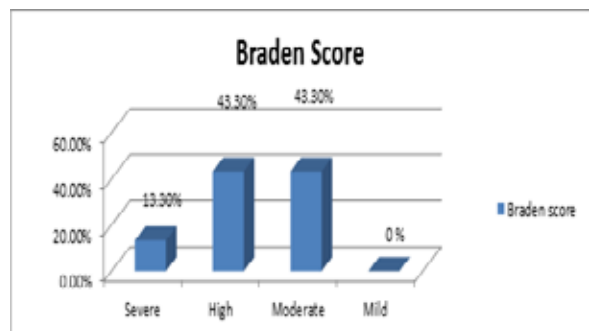
Table No. 2a – Frequency and percentage distribution of Braden score of Medical ward.

Braden score	Frequency	Percentage	Grade
15 – 18	0	0 %	Mild Risk
13 – 14	16	53.3 %	Moderate risk
10 – 12	13	43.3 %	High risk
<9	1	3.3 %	Severe risk

Table No.2b – Frequency and percentage distribution of Braden score of Surgical ward.N=30

Braden score	Frequency	Percentage	Grade
15 – 18	0	0 %	Mild Risk
13 – 14	13	43.3 %	Moderate risk
10 – 12	13	43.3 %	High risk
<9	4	13.3 %	Severe risk

Table No.2b Depicts that only 4 (13.3 %) have severe risk of pressure ulcer, 13 (43.3 %) have high risk, 13 (43.3%) had moderate risk.



SECTION – 3: ASSESSING THE KNOWLEDGE OF CARE GIVER REGARDING CARE OF PRESSURE ULCER

Table No. 3 - frequency and distribution of knowledge assessment score of Medicine Ward admitted patient's caregiver N = 30 (Medicine ward)

Knowledge Score	Frequency	Percentage (%)	Grade
<10	0	0	Very Poor
10-14	3	10	Poor
15-19	15	50	Average
20-24	12	40	Good

Table No. 3a – Depicts that no one caregiver had very poor knowledge, 3 (10 %) had poor knowledge, 13 (50 %) had average knowledge and 12 (40 %) had good knowledge.

Table No. 3b - frequency and distribution of knowledge assessment score of Surgery Ward admitted patient's car-

egiver N = 30 (Surgery ward)

Knowledge Score	Frequency	Percentage (%)	Grade
<10	0	0	Very Poor
10-14	7	23.33	Poor
15-19	14	46.67	Average
20-24	9	30	Good

Table No. 3b - Depicts that no one caregiver had very poor knowledge, 7 (23.33%) had poor knowledge, 14 (46.67 %) had average knowledge and 9 (30%) had good knowledge.

SECTION 3 – Association between pressure ulcer risk and selected demographic variable including Knowledge score

		Mild Risk	Moderate Risk	Severe Risk	Karl's pearson "r" value
Educational Status	Illiterate	13	5	0	Pearson Correlation (0.644**) Sig. (2-tailed) (0.001)
	Primary education	8	10	3	
	Secondary Education	7	8	0	
	Graduate	2	3	2	
Income per monthly	Below 2000	1	3	0	Pearson Correlation (0.556**) Sig. (2-tailed) (0.001)
	2001-6000	21	15	3	
	6001-10000	5	6	1	
	>10000	2	2	1	
Knowledge score	Very poor	1	3	0	Pearson Correlation (0.383*) Sig. (2-tailed) (0.036)
	Poor	21	15	3	
	Average	5	6	1	
	Good	2	2	1	

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

* Correlation is significant at the 0.05 level (2-tailed).

COMPARE RISK OF PRESSURE ULCER IN MEDICAL AND SURGICAL WARD. Table no. 4 – Comparison of frequency and percentage distribution of subject according to Braden assessment scores. N=60

Braden Test	Severe risk <9	High risk 10-12	Moderate risk 13-14	Mild risk
Medical Ward	3.3 % (1)	43.3 % (13)	53.3 % (16)	0%
Surgical Ward	13.3 % (4)	43.3 % (13)	43.3 % (13)	0%

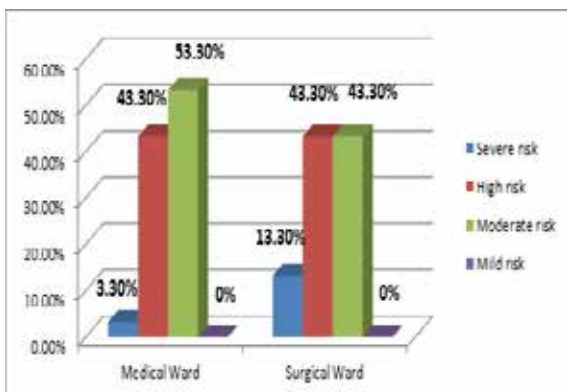


Table No. 5 – Comparison of frequency and percentage distribution of subject according to knowledge score gain by the admitted patients of Medical and surgical unit N = 60

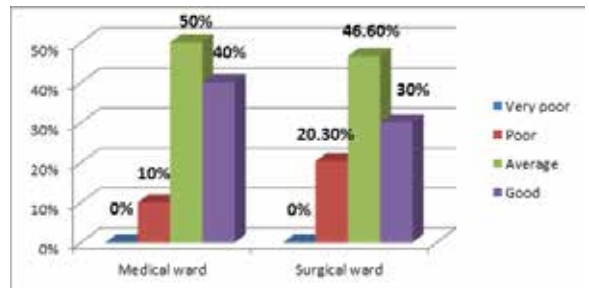


Figure No. 5 - Bar Diagram showing comparison of Medical and surgical ward subject knowledge score.

Table No. 6 – Mean SD, Mean difference and 't' value of Medical and Surgical ward admitted patient Braden Assessment Score regarding assessment of risk of Pressure ulcer.

Assessment area	Mean	Mean Percentage	Standard Deviation	N = 60	
				Mean difference	't' Value
Medical Ward	15.43	51.43%	2.13	3.37	8.21
Surgical Ward	18.8	62.67%	2.73		

P<0.05*

p<0.01**

P<0.001**

Tabled 't' = 2.00; (p<0.001) *** Highly significant

DISCUSSION

Uninterrupted pressure exerted on the skin, soft tissue, muscle, and bone can lead to the development of localized ischemia, tissue inflammation, shearing, anoxia, and necrosis. Pressure ulcers affect up to three million adults in the United States. Areas of the body prone to the development of pressure ulcers are depicted in Figure A. Estimates of the incidence of pressure ulcers vary according to the setting, with ranges of 0.4 to 38.0 percent in acute care hospitals, 2.2 to 23.9 percent in long-term nursing facilities, and 0 to 17 percent in home care settings.^{1,2} The prevalence of pressure ulcers in acute and long-term care settings was 9.2 to 11.1 percent between 1989 and 1995 and 14.7 to 15.5 percent between 1999 and 2005.³

Pressure ulcer healing rates which depend on co morbidities, clinical interventions, and ulcer severity vary considerably. Ulcer severity is assessed using a variety of different staging or grading systems, but the National Pressure Ulcer Advisory Panel (NPUAP) staging system is the most commonly used (Figure B). Co morbidities predisposing toward pressure ulcer development and affecting ulcer healing include those affecting patient mobility (e.g., spinal cord injury), wound environments (e.g., incontinence), and wound healing (e.g., diabetes and vascular disease). Delayed healing can add to the length of hospitalization and impede return to full functioning.² Prevalence of pressure ulcers is used as an indicator of quality for long-term care facilities, and progression of pressure ulcers in hospitalized patients is often considered an avoidable complication representing failure of inpatient management.¹⁴

Given the negative impact pressure ulcers have on health status and patient quality of life, as well as health care

costs, treatments are needed that promote healing, shorten healing time, and minimize the risk of complications. Pressure ulcer treatment involves a variety of different approaches, including interventions to treat the conditions that give rise to pressure ulcers (support surfaces and nutritional support); interventions to protect and promote healing of the ulcer (wound dressings, topical applications, and various adjunctive therapies, including vacuum-assisted closure, ultrasound therapy) The development of pressure ulcers is often misunderstood. To the sufferer, they are at best distressing and painful, and can lead to social isolation. At worst, they can place an enormous burden on the sufferer's health and can trigger complications that threaten life itself. The distressing fact is that in most cases pressure ulcers are quite preventable. The threat of litigation, (an increasingly common result of pressure damage) together with the colossal costs involved in the treatment of pressure ulcers makes this a subject of huge importance to us all.

- Pressure ulcer (Pr U) incidence is associated with an increased Morbidity & Mortality – nearly 70% die within six months. (Brown 2003)
- Pr U incidence is increasing in long term care. (LTC) (Horn et al. 2004)
- Reduction of pressure ulcer prevalence in LTC is a Healthy People 2010 initiative.
- Pr U incidence has been determined to be a quality of care indicator for LTC facilities and compliance is regulated by the Centre for Medicare and Medicaid. (CMS 2004)
- Leg ulcers affect more individuals than Pr Us; one in four Americans over the age of 65 will develop a leg ulcer in their lifetime (Wound Ostomy and Continence Nurses Society)

Pressure ulcers can be unpleasant, upsetting and challenging to treat. Therefore, a range of techniques is used to prevent them developing in the first place. These include: regularly changing a person's position , using equipment to protect vulnerable parts of the body, such as specially designed mattresses and cushions , Unfortunately, even with the highest standards of care, it is not always possible to prevent pressure ulcers in particularly vulnerable people.²⁴

Pressure ulcer is one of the preventable problem in hospitalize setting . it is very interesting issue that many health care giver want to reduce or quit it for fulfilment of this purpose many risk assessment scale was developed. These scale help to identify need of giving preventable care to the ill patient. Unfortunately there is no proper counselling and guidance cell in many hospitals to address this issue. Most of hospital concentrate only on pharmacological intervention of health problem, very few hospitals focus on health education for prevention of pressure ulcer. Data presented in Table No. 1 deals with distribution of sample according to age, sex, education, religion, type of family, income, marital status and weight. Regarding age most of subject 20 (33.33%) were in the age group of 51-60 yrs, 17 (28.33%) were in the age group of 36-50 yrs, 16 (26.66%) were in the age group of 25-35 yrs, 7 (11.67%) were in the age group of more than 65 yrs. In this study 35 (58.33%) of the subject were male and 25 (41.67%) of the subject were female. Regarding education most of the subject 19 (31.67%) are illiterate and primary educated, 15 (25%) are secondary level educated and 7 (11.67%) are graduate. Regarding religion 60 (100%) subject were Hindu. In this study 35 (58.88%) of subject were belonging to joint family and 25 (45.67%) of subject were belonging to

nuclear family. Most of subject 39 (65%) monthly income had rupees 2000-6000/-, 12 (20%) subjects had monthly income within 6000-10000/-, 5 (8.33%) subjects had more than 10000/- rupees monthly income and very less 4 (6.65%) subject had less than 2000/- rupees income. Most of subject 55 (91.67%) were married, 3 (5%) were widow and 2 (3.33%) subject were unmarried. Regarding weight 23 (38.33%) subject were within 40-50 kg, 21 (35%) subject were within 50-60 kg, 12 (20%) subject were within 60-70 kg and 4 (6.67%) subject were within >70 kg. **Table No2a.** Depicts that only 1 (3.3 %) have severe risk of pressure ulcer, 13patients were (43.3 %) have high risk, 16 patients were (53.3%) had moderate risk. **Table No2b.** Depicts that only 4patients were (13.3 %) have severe risk of pressure ulcer, 13 patients were (43.3 %) have high risk, 13 (43.3%) had moderate risk.**Table No. 3a** – Depicts that **3 (10 %)** had poor knowledge, **13 (50 %)** had average knowledge and **12 (40 %)** had good knowledge.**Table No. 3b** - frequency and distribution of knowledge assessment score of Surgery Ward admitted patient's caregiver N = 30 (Surgery ward) **Table No. 4** - deals with distribution of participants based on Braden assessment scale in this most of subject 53.3%(16) have moderate risk, 43.3% (13) patient have high risk and very less 3.35 (1) have severe risk in medicine ward and in the comparison in surgery ward we find that the number of patient who have high risk and moderate risk are similar that is 43.3% (13) and 13.3% come under severe risk and in both medical and surgical no one patient come under mild risk. **According to table No. 4** Which showing association b/w Braden assessment score for pressure ulcer risk and with various demographic variables find that a good association of Braden score with patient education and their family income. If patient is highly educated and their family socioeconomic condition is good then in those patient have less risk of development of pressure ulcer. In other association b/w knowledge and various demographic variables showing that knowledge of medical ward have association with Braden score and knowledge of surgical ward patient association with family income, if patient have good score in Braden assessment scale have good knowledge about care of hospitalized patient. According to table Medical ward hospitalized patient who have good socioeconomic condition showing poor risk of developing pressure ulcer. According to education table showing a good association with a patient weight and their income and poor association with Braden score, If patient have higher education then their socioeconomic condition is good and they will gain good weight. Education is associated with Braden score showing that they have less risk than illiterate patients. According to weight association with demographic variable showing a good association with income and Braden score less association with knowledge of relatives about care of hospitalized patient. Possible associations such as age, sex, body mass index (BMI), smoking, hypertension and atherosclerosis was studied. All results were analysed using the software Statistic version 6. PAD was present in 23 (27.71%) patients. Older age, longer duration, smoking, high BMI and hypertension were found to be significantly associated with PAD. A very strong level of agreement was found between venous Doppler and ABPI. Assessment for the presence of PAD is important in all clinically diagnosed venous ulcer patients. ABPI being a simple, non-invasive outpatient department (OPD)-based procedure, can be routinely used in cases of venous ulcer to find out the hidden cases of PAD even in developing countries^{9,10}. **Table No.5** – deals with distribution of participants based on knowledge assessment questionnaire reveals that most of subject (50%) has average knowledge, (40%) have

good knowledge, (10%) have poor knowledge in Medical ward. In surgical ward most of subject (46.6%) have average knowledge, (30%) have good knowledge and (20.3%) have poor knowledge. Geriatric fellows in New York State who participated in the survey felt "adequately" prepared to lead a team and teach about pressure ulcers. Sixty-nine percent reported having teaching responsibilities. Sources of information included bedside rounds (79%), nurses (71%) lectures (67%), textbooks (67%), and geriatric attendings (60%). Educational settings were nursing homes (86%) and hospital units (64%). Forty-eight percent of geriatric fellows surveyed correctly identified the Braden Scale as a screening tool. Sixty-seven percent identified a description of a Stage I pressure ulcer and 52% identified a description of a Stage IV pressure ulcer. The mean score on the knowledge test for the cohort was 58 +/- 18% (SD) correct (range, 20% to 80%); the range for the fellowship programs was 36% to 62% correct^{25,26}. **Table 6-** reveals high risk score in Medical ward, Mean is (15.43) either in Surgical ward less risk of pressure ulcer than Medical ward, there Braden score mean is (18.8). The mean difference is (3.37), and computed 't' value is ('t' = 8.21***, p<0.001) which shows a highly significant risk of pressure ulcer in Medical ward.

Conclusion: The main aim of this study was to assess the knowledge of patient's caregiver and to compare the risk of pressure ulcer in medical and surgical ward. After the detected analysis of this study leads to following conclusion- Medical ward have more chance to develop pressure ulcer as compare to surgical ward. In medical ward finding of Braden score have 15.43 and surgical ward finding was 18.8 which was found to be Significant higher. Attendants who are educated and have good socio-economic condition have more knowledge of pressure ulcer and its management. There was no significant association found in demographic variables like age, sex, marital status and type of family.

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