



Prevalence of Bed Sore and its associated Factors among Patients admitted at Jimma University Medical Center, Jimma Zone, Southwestern Ethiopia, 2017 Cross-sectional study

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Abstract

Introduction: Bed sore or pressure ulcer is an area of localized damage to the skin and underlying tissue caused by pressure, shear and or a combination of these. The current study was done to determine the magnitude bed sore, and its associated factors among patients admitted at Jimma University Medical Center.

Methods: A Hospital- based cross-sectional study was conducted from March 1-15/ 2017 among patients admitted in Jimma University Medical Center with a total sample size of 166. The study subjects were selected by systematic random sampling technique and the first study unit was taken by lottery method. Data was collected through face to face interview using structured questionnaire. The Braden scale risk assessment tool was used to assess the risk of bed sore occurrence. Descriptive statistics and chi square test was done using SPSS version 20.0. Chi square was done to check the potential predictors of bed sore. The result was displayed using statements and tables.

Results: All selected admitted adults patients were participated in the study. The overall prevalence of bed sore among admitted patients was 9.6 % and out of these 13 (81.2%) were developed after admission. From the total of bed sore identified, 18.5% were stage I, 44% were stage II, 25% were stage III and 12.5% were stage IV. Among the total patients who developed bed sore, 44 % were found on sacral area, 25 % were greater trochanter, 12.5 % were on the heel and 18.5 % were on the occipital region. Age, Educational status, being bed ridden , change of patient position in bed and its frequency, and Braden scale risk assessment scoring were predictors of bedsore.

Conclusion and Recommendation: The prevalence of bed sore was high. Health care professionals particularly Nurses are responsible for the prevention of bed sore by applying quality of care such as frequent hygienic and comforting care.

Keywords: Bed sore; Jimma University Medical Center; Admitted patient

Abbreviations: PI: Pressure Injury; PU: Pressure Ulcer; JUMC: Jimma University Medical Center

Introduction

A bed sore (also known as pressure sore, pressure injury (PI), decubitus ulcer or pressure ulcer (PU), has previously been defined as “an area of localized damage to the skin and/or underlying tissue usually over a bony prominence as a result of pressure combined with shear and it has long been recognized as a major cause of morbidity, mortality and health care burden globally [1-4]. Bed sore leads to ischemia, cell death & tissue necrosis, as capillaries are compressed and the blood flow is

restricted, the cutaneous tissues become broken or destroyed, leading to progressive destruction and necrosis of underlying soft tissues. This process results in a painful and slow healing of pressure ulcer [5].

Development of pressure ulcers is complex and multifactorial. Different studies revealed that bed sore development can be associated with health facility and patient condition such as; Age, length of hospital stay, nutritional status, diseases

condition which limit mobility and activity, level of mental status of the patient, condition of bed and lack of sufficient nursing care in general [5-9]. In critical care patients, pressure ulcers are an additional co-morbid threat in patients who are already physiologically compromised. In fact, pressure ulcers are one of the most underrated medical problems in critical care patients [6]. Pressure ulcer affect millions of people worldwide, and remain a major health problem, but the burden & incidence rates of pressure ulcers vary greatly with the health care settings [4].

In Ethiopia, the prevalence of bedsore was high (16.8%) among hospitalized patients, prolonged length of stay in hospital, problem of sensory perception, and friction and shearing were more liable to develop pressure ulcer [5]. Pressure ulcers can reduce overall quality of life due to pain, treatments, and increased length of institutional stay, and may also contribute to mortality in some patients [10]. Despite advances in medical technology and the use of formalized prevention programs based on clinical practice guidelines, the prevalence of bed sore during hospitalization continues to increase [6]. Therefore, enormous effort is required to find effective and reliable techniques for preventing the initiation of ulcers and eliminating them once they develop [11]. To reduce the occurrence of pressure ulcer on the individual admitted in the health facilities, it is an accepted practice that risk assessment should be undertaken on individuals, with the aim of identifying those who are at potential risk in order that individualized preventive interventions can be planned and initiated [12].

Any intervention that may help to prevent pressure ulcers or to treat them once they occur is important to reduce the cost of pressure ulcer care and improve quality of life for affected individuals [10]. Thus, this study will assess the prevalence of bed sore and its associated factors among hospitalized patients of Jimma University Medical Center (JUMC).

Method and Materials

The study was conducted in JUMC which is found in Jimma town. The town is located 352 kms Addis Ababa South-west of the country. JUMC provides services for approximately 9000 inpatient and 80000 outpatient attendants a year. The medical center has a bed capacity of 515 beds in different wards. A Hospital-based cross-sectional study design was conducted from March 1-15/ 2017 among admitted patients of JUMC wards namely; Medical ward, Surgical ward, Maternity ward and Intensive care units. The study population was 166 adult in patients who had admitted in the hospital ≥ 1 day. Sample size was computed based on a single proportion population formula with the prevalence (p) of bed sore was 16.8 %, taken from previous study conducted at Feleghiwot referral hospital, Bahir Dar, Ethiopia [5]. The final sample was selected on patient occupied bed numbers by systematic sampling technique from each ward and the first study unit will be taken by lottery method. The total number of study participants was distributed proportionally to each ward according to number of patents admitted in each wards of JUMC.

Data was collected through face to face interview using structured questionnaire and physical examination. The Braden scale risk assessment tool was used to assess the risk of pressure ulcer or bed sore. The standardized questionnaires is prepared in English language and translated into Afan Oromo language in order to suit for the patient during the interview. After translating it, retranslation back into English language.

Three Nurses were recruited for data collection and one Nurse was selected from JUMC for supervision. Training was given by the principal investigator for both data collectors and supervisors. During data collection, the data collectors was filled the data from each patient based on the questioner. Inspection for completeness and quality of data was carried out by principal investigator.

Pretest was conducted using 5% of the study population at Shenen Gibe District Hospital which is located in Jimma town which is located 7 km away from JUMC and necessary modifications was done before the actual data collection. The data was checked, cleaned and entered into SPSS version 20.0. Descriptive statistics, and Chi square was done to check the potential predictors of bed sore. The strength of association was interpreted using confidence interval. P value < 0.05 was considered statistically significant in this study. The result was displayed using statements and tables.

Dependant variable: Bed sore

Independent variables: Age, Sex, Residence, Education status, Smoking cigarette, Length of stay in hospital, Bed ridden and Position change service.

Operational Definition

Prevalence of Bed sore: the proportion of admitted patients who have developed a bed sore at the time of the study. Bed sore: any lesion caused by unrelieved pressure resulting in damage of skin and underlying tissue of admitted patients. Stage I bed sore: Intact skin with signs of impending ulceration, initially presenting blanchable erythema indicating reactive hyperemia.

According to EPUAP Pressure Ulcer Staging [17]

- i. **Stage I bed sore:** Intact skin with signs of impending ulceration, initially presenting blanchable erythema indicating reactive hyperemia
- ii. **Stage II Bed sore:** A partial-thickness loss of skin involving epidermis and dermis.
- iii. **Stage III Bed sore:** A full-thickness loss of skin with extension into subcutaneous tissue but not through the underlying fascia.
- iv. **Stage IV Bed sore:** A full-thickness tissue loss with extension into muscle, bone, tendon, or joint capsule
- v. **Sensory Perception:** level of response of the patient for touch sensation.

vi. Mobility: ability of the patient to change position within abed or to move out of the bed

vii. Bed Ridden: patient who are Unable to move out of bed

viii. Braden Scale: is a summated rating scale made up of six subscales scored from 1 -3 or 4, for total scores that range from 6-22. A lower Braden Scale Score indicates a lower level of functioning and, therefore, a higher level of risk for pressure ulcer development. In this study, Patients was categorized as vulnerable to pressure ulcer development when Braden score is <17 or with a pressure ulcer and no risk of pressure ulcer at Braden score ≥17 [12].

Ethical Consideration

Before the data collection, ethical clearance letter was obtained from Jimma university institute of health & faculty of health sciences, school of Nursing and Midwifery. The letter was submitted to the Jimma university medical center management for permission. The respondents were informed about the purpose of the study, and their oral consent was obtained. Also the right to refuse or withdraw from participating in the

interview was fully maintained and the information provided by each respondent was kept strictly confidential by making each questionnaire coded and not sharing personal information of any patient to the third party.

Results

Socio-Demographic Characteristics of Patients Admitted at JUMC, from March 1-15/2017

All selected adults (166) who were admitted to different wards of JUMC were participated with a of response rate 100 %. Most of the study participants are from medical, surgical and maternity wards which were 46 (27.7%), 66 (39.7%) and 51 (30.8%) respectively. Among a study participants 96 (57.8%) were female and 70 (42.2%) males. All respondents were above 18 years old and 35(21.0%) and 48 (28.9%) of the respondents were 24-35 and 3-44 years of age group respectively. Concerning the educational status of the participants, 62 (37.4 %) were illiterates. Whereas 45 (27.1%) and 30 (18.1%) were grade 9-10, and certificates and above respectively. Regarding the cigarette smoking history of the patients; 6 (3.6%) current smokers, 50 (30.1%) previous smoker and 110 (66.3%) were never smoked cigarettes (Table 1).

Table 1: Socio-demographic characteristics of patients admitted at JUMC, from March 1-15/2017. (n=166).

Variables	Categories	Frequency	Percentage (%)
Age	18-24	20	12.0
	25-34	35	21.0
	35-44	48	28.9
	45-54	30	18.1
	55-64	20	12.0
	>64	13	8.0
Sex	Male	70	42.2
	Female	96	57.8
Residence	Rural	97	58.4
	Urban	69	41.6
Ward	Medical	46	27.7
	Surgical	66	39.7
	Maternity	51	30.8
	Intensive care unit	3	1.8
Educational status	Illiterate	62	37.4
	Grade 1-8	12	7.2
	Grade 9-10	45	27.1
	Grade 11-12	17	10.2
	Certificate & above	30	18.1
Marital status	Single	45	27.1
	Married	95	57.2
	Divorced	15	9.0
	Widowed	11	6.7

Cigarette smoking history	Current	6	3.6
	Previous	50	30.1
	Never smoke	110	66.3

Hospital Related Risk Factors of Bed Sore Among Patients Admitted at JUMC, from March 1-15/2017

Among the total respondents, 84 (50.6 %) of them spends ≥16 days in the hospital, where as 60(36%) patients were stayed in the hospital for 8-15 days. Also 24 (14.5%) was bed ridden but 142 (85.5%) were not.

Concerning the hygienic and comforting service given by the hospital; only 12 (7.2%) of them were ever bathed and massaged after admission and bed sore preventive device were applied for 18 (10.8%) of patients. Also patients position change on bed service given for 150 (90.4%) and among them 100 (60.2%) were every 2 to 3 hours (Table 2).

Table 2: Hospital risk factors related to bed sore among patients admitted at JUMC, from March 1-15/2017. (n=166).

Risk factor	Categories	Frequency	Percent (%)
Length of stay in the hospital	≤ 7 days	22	13.3
	8-15 days	84	50.6
	≥ 16 days	60	36.1
Use of bed sore preventive device	Yes	18	10.8
	No	148	89.2
Does the patient were bed ridden	Yes	24	14.5
	No	142	85.5
Patient position change in bed	Yes	150	90.4
	No	16	9.6
Frequency of patients position change	Every 2 to 3 hours	100	60.2
	Every 4 hours	36	21.7
	4 times per day	30	18.1
Ever bathed and massaged after admission	Yes	12	7.2
	No	154	92.8

Braden Scale Risk Assessment Result of Patients Admitted at JUMC, from March 1-15/2017.

According to Braden scale risk assessment 17 (10.2 %) of the respondents had completely limited sensory perception,

where as 79(47.6%) were constantly moist, and 24(14.5%) of them were bed fast and completely immobile. Also 36 (21.7%) of patients were categorized as very poor nutritional status and 16 (9.6%) of them had friction and shear problem (Table 3).

Table 3: Braden scale risk assessment result of patients admitted at JUMC, from March 1-15/2017. (n=166).

Braden scale	Category	Frequency	Percent (%)
Sensory perception	Completely limited	17	10.2
	Very limited	24	14.5
	Slightly limited	38	22.9
	No impairment	87	52.4
Moisture	Constantly moist	79	47.6
	Very moist	40	24.1
	Occasionally moist	26	15.7
	Rarely moist	21	12.6
Activity	Bed fast	24	14.5
	Chair fast	37	22.2
	Walks occasionally	68	41
	Walks frequently	37	22.3

Mobility	Completely immobile	24	14.5
	Very limited	37	22.2
	Slightly limited	68	41
	No limitation	37	22.3
Nutrition	Very poor	36	21.7
	Probably inadequate	88	53
	Adequate	42	25.3
Friction & shear	Problem	16	9.6
	Potential problem	40	24.1
	No apparent problem	110	66.3

Braden Scale Risk Assessment Scoring Result among patients admitted at JUMC, from March 1-15/2017

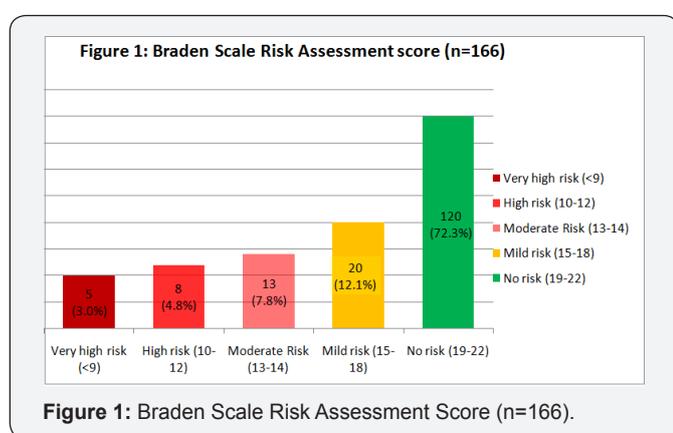


Figure 1: Braden Scale Risk Assessment Score (n=166).

According to Braden scale risk assessment score, 5(3%) of the respondents were very high risk for bed sore development and 120(72%) of them had no risk (Figure 1).

Prevalence and characteristics of bed sore among patients admitted at JUMC, from March 1-15/2017

The current study finding showed that the prevalence of bed sore was 9.6 % (16/166) and out of these 13 (81.2%) were occurred after admission. Based on EPUAP grading scale 7 (43.7%) was stage II bed sore which was found on the sacral region. Also 10 (62.5%) of the case was identified among patients admitted at medical ward (Table 4).

Factors associated with pressure ulcer among patients admitted at JUMC from March 1-15/2017

According to the current finding age, educational status, being bed ridden, position change and

the frequency of position change, and Braden scale risk assessment scoring were significant

predictors of bed sore. But sex, residence, marital status and smoke cigarette were not associated

with bed sore development (Table 5).

Table 4: Prevalence and characteristics of bed sore among patients admitted at JUMC, from March 1-15/2017. (n=16).

Characteristics	Category	Frequency	Percent (%)
Bed sore present	Yes	16	9.6
	No	150	90.4
Where bed sore was developed	Before admission	3	18.8
	After admission	13	81.2
Anatomical location of bed sore	Sacral	7	43.7
	Greater Trochanter	4	25.0
	Occipital	3	18.8
	Heel	2	12.5
Stage of bed sore	Stage I	3	18.8
	Stage II	7	43.7
	Stage III	4	25.0
	Stage IV	2	12.5
Types of ward	Medical	10	62.5
	Surgical	4	25
	Intensive care unit	2	12.5

Table 5: Factors associated with pressure ulcer among patients admitted at JUMC from March 1-15/2017.

Variables	Category	Bed sore developed		P value
		Yes	No	
Age	18-24	2	18	0.01*
	25-34	0	21	
	35-44	2	46	
	45-54	4	26	
	55-64	3	17	
	>64	5	8	
Educational status	Illiterate	13	49	0.004*
	Grade 1-8	1	11	
	Grade 9-10	0	45	
	Grade 11-12	0	17	
	Certificate & above	2	28	
Bed ridden	Yes	16	8	0.001*
	No	0	142	
Patient position change in bed	Yes	10	140	0.001*
	No	6	10	
Frequency of patient position change in bed	Every 2 to 3 hour	10	100	0.001*
	Every 4 hours	2	34	
	4 times per day	4	26	
Braden scale risk assessment scoring	Very high risk ≤ 9	10	20	0.001*
	High risk 10-12	3	2	
	Moderate 13-14	3	10	
	Mild risk 15-18	0	20	
	No risk 19-22	0	120	

*Significant P value

Discussion

Hospital based cross-sectional study was conducted among 166 patient admitted at JUMC. The study finding revealed that the overall prevalence of bed sore was 9.6 %. Similar study done in Bahir Dar Felge Hiwote referral hospital of Ethiopia states that the prevalence of bed sore was 16.8%, which was higher than the current study finding [5]. Also studies conducted in hospitals of China [3], Brazil [7] and Germany [13] reported that overall prevalence of pressure ulcers were 1.58%, 16.9% and 26.5 % respectively. The discrepancy of the findings may be due to the difference in hospital factors such as nursing care service and sample size of study participants.

From the total 16 (9.6%) of bed sore developed, 18.5% were stage I, 44% were stage II, 25% were stage III and 12.5% were stage IV. Study done at Felge Hiwot referral hospital indicated that among patients who developed bed sore, 62% were stage I which was higher than the current study. Stage II, III and IV were 26.8%, 8.4% and 2.8% respectively which was lower than the current study [5]. Study result from Nigerian hospital reveals were stage I and II were 8.3% and 20.8% respectively which was

lower than the current finding. But stage III and IV were 37.5% and 33.5% which were higher than the current study result [14]. Another similar study done in one of Brazil hospital reveals that stage I, II, III and IV were 30.3 % , 32.4%, 22.8%, and 13.9 % respectively [7]. Also study done in a China hospital showed that was stage I, II, III and IV were 28.7%, 35.8% 12.7% and 12.9% respectively [3]. The prevalence of Stage I and IV, as per the Brazilian and Chinas hospitals, findings were higher than the current study but stage II and III were lower than the current study finding.

According to the current finding bed sore was identified on different anatomical location of the

patients. Among the total patients who developed bed sore, 44 % were found on sacral area, 25% were greater trochanter, 12.5 % were on the heel and 18.5 % were on the occiput. This finding was consistent with a study done at Felge Hiwot referral hospital of Ethiopia which showed 70.4 % bed sore were developed on sacral region [5]. In addition, study in Brazil hospital sacral 82.5 % was sacral, 37.5% was greater trochanter and 16.2 % was occipital region [7]. Also study finding from China

hospital 60.52% of bed sore was sacral and 6.34% was identified on the greater trochanter [3]. Most studies [3,4,7], including the current, done on bed sore indicated the distribution was mainly sacral or the greater trochanter region. This is due to the sacral region is a weight bearing area for a person with lying or sitting position. Also the sacral area is exposed to moisture due to incontinency. This was supported by the current finding which revealed that all patients who developed bed sore were bed ridden.

In this study, age of the patient, being bed ridden, patients position change in bed and Braden scale risk assessment scoring was associated with the occurrence of bed sore which was supported by different study findings [5-7,15,16]. According to the current study length of stay in the hospital was not associated with occurrence of bed sore. But other studies [5,16] revealed that the development of pressure ulcer was associated with longer stay of the patients in hospital. Also studies indicated risk factors that have been related to pressure ulcer development are dry skin, impaired mobility, altered mental status (i.e., confusion), sepsis, urinary and fecal incontinence, malnutrition, physical restraints [5-9,17,18].

Conclusion and Recommendation

The prevalence of bed sore among patients who were admitted to JUMC was high. Age, change of patient's position, being bed ridden and the Braden scale risk assessment score were predictors of bed sore. Health care professionals particularly Nurses are responsible for the prevention of bed sore by applying quality of care such as frequent hygienic and comforting care.

Consent for publication

All authors are agreed to publish and disseminate the current research result.

Availability of Data and Materials

All the data sets used and/or analyzed during this study are included in the article.

Author's contribution

This work was carried out in collaboration between all authors. Author TA designed the study, performed the statistical analysis, wrote the protocol, and wrote the first draft of the manuscript. Author TA and Author FD managed the analyses of the study. Author DS managed the literature searches. All authors read and approved the final manuscript.

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