

# Bed-sore and Associated Factors Among Patients Admitted at Surgical Wards of Wolaita Sodo University Teaching and Referral Hospital, Southern Ethiopia

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**Abstract:** Background: Bed sore has long been recognized as major cause of morbidity, mortality and health care burden globally and worst in developing countries like Ethiopia. It is one of key performance indicators of quality of care provided to patient. Therefore, this study was aimed to assess magnitude of bed sore and associated factors among patients admitted to surgical ward of Wolaita Sodo University Teaching and Referral Hospital, South Ethiopia. Method: We conducted institution-based cross-sectional study from February- June, 2019. A systematic random sampling technique was applied to select 237 patients who were admitted to surgical ward of Hospital. We collected data through face to face interview using a structured and pretested questionnaire, prepared check lists and physical examination. After collection, we entered data into Statistical Package for Social Sciences Version 23. We conducted descriptive analysis and logistic regressions to identify factors associated with dependent variable. We declared presence of statistically significant association at p-value less than 0.05 at 95% confidence interval. Results: Eight patients or 3.4% among 237 admitted patients developed bedsore. Patients older than fifty three years (AOR=11.84, 95%CI (1.05, 133.259), living in rural area (AOR=6.64, 95%CI (1.09, 40.58) and being bedridden patient (AOR=7.82, 95%CI (1.27, 48.38) possessed factors associated with bedsore development. Conclusion and recommendation: The magnitude of bed sore was medium; but it needs improvement because it is one of criteria that indicate quality of service rendered in hospital. Bedsore occurrence was associated with increasing age, rural residence and being bedridden patient. Therefore, frequent positioning of the patient and health education for patients from rural areas and special and frequent care for those unable to care for themselves were needed to minimize occurrence of bed sore.

**Keywords:** Pressure Ulcer, Bed Sore, Decubitus Ulcer, Bedridden Patient

## 1. Introduction

Bed sore is severe condition of skin due to localized injury on the skin and/or underlying tissue usually over a bony prominence area. Bed sore is one of the most common complications for bed-ridden patients hospitalized in acute and chronic care services and imposes a major burden on patients, their relatives and caregivers. Loss of sensory perception and immobility are the main risk factors for decubitus ulcers because patients may not be aware of the discomfort and do not change their position to relieve the pressure [1-6].

Bed sores are a serious and common problem for older

persons, affecting approximately 1 million adults in the United States. As the population ages, pressure ulcers will continue as a major health care problem. Local blood supply to the skin decreases, epithelial layers flatten and thin, subcutaneous fat decreases, and collagen fibers lose elasticity. The prevention and healing of pressure ulcers requires the cooperation and skills of the entire interdisciplinary health care team [7-1].

The frequent assessment and effective skin care prevent the development of bed sore. Nurses should develop management plan to prevent development of bed sore in patients who are identified as being at risk. It improves

healing and prevents complications of existing pressure ulcer. This is because nurses have a responsibility to monitor patient's skin in order to plan, implement and evaluate interventions that maintain skin integrity by using their knowledge and skill [3, 13-17].

Bed sore is a serious condition that needs cooperation among all the medical disciplines. Pressure ulcers are serious and common health concern affecting about 1.5-3 million adults and is a serious health concern among elders. Despite advances in medical technology and the use of formal prevention programs based on clinical practice guidelines, the prevalence of bed sore during hospitalization continues to increase to 80%. The study finding on prevalence and associated factors of pressure ulcer among hospitalized patients in Felege Hiwot referral hospital revealed that 16.8% of them had pressure ulcer in Ethiopia [2, 13, 15].

Bed sore is serious condition that leads to ischemia, cell death, and 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. Several factors were contributed to pressure ulcer development. These were intrinsic factors such as advanced age (>65 years), limited mobility, poor nutrition, co-morbidities, incontinence impaired sensory perception, altered tissue perfusion, organ system failure, and infection and extrinsic factors like force and duration of pressure, shearing, friction and macerations [22-24].

Though modern medical science has launched a variety of treatment methods, prevention is the best way to get rid of it. Bed sores are best prevented by using support surfaces that are volatile in nature-like water mattress, variable pressure mattress [2, 10, 15, 20].

Although there are some pressure ulcer prevention protocols in public hospitals, still there is number of patients suffering from bed sore and it is serious condition that spreads across all the medical disciplines and considerable health care problem. Therefore, it important to assess magnitude of bed sore and its associated factors among patients admitted at Wolaita Sodo University Teaching and Referral Hospital in Surgical Ward South Ethiopia.

#### Objectives

1. To determine magnitude of bed sore among patients admitted at surgical ward of Wolaita Sodo University Teaching and Referral Hospital, 2019.
2. To identify factors associated with bed sore among patients admitted at surgical ward of Wolaita Sodo University Teaching and Referral Hospital, 2019.

## 2. Methods and Materials

### 2.1. Study Setting and Population

We conducted a hospital-based cross-sectional study in Wolaita Sodo University teaching and referral Hospital (WSUTRH) from February- June, 2019. This hospital is found in Wolaita Sodo Town. WSUTRH has about 300 beds and 5 operation rooms. All patients admitted to WSUTRH

were considered as source population. We randomly selected study population from patients admitted to surgical wards during the study period.

### 2.2. Inclusion and Exclusion Criteria

All patients admitted to surgical wards of hospital for more than two days before data collection were included in the study. Patients whose age less than 18 years old, unable to sign consent, mentally ill and patients who are admitted for the second time during data collection period were excluded from study.

### 2.3. Sample Size and Sampling Technique

The sample size was determined using single population proportion formula. The sample size was calculated taking prevalence of pressure ulcer among hospitalized patients in Felege Hiwot Referral Hospital (P=16.8%) [15]. The final sample size after adding 10% non-response rate was 237.

We got study participants by using systematic random sampling technique. The total number of study participants was proportionally distributed to different units of surgical ward according to number of patients admitted.

### 2.4. Data Collection Tools and Procedures

The 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 and comprised the following items: sensory perception, skin moisture, physical activity, mobility, nutrition, and friction/shear [40]. The standardized pre-tested structured questionnaire which prepared in English was used.

Data was collected by two nurses and supervised by one senior nurse. Brief training and pretest was done before actual data collection. Data was checked daily for completeness and quality by supervisor.

### 2.5. Study Variables

#### 2.5.1. Dependent Variable

Bed sore.

#### 2.5.2. Independent Variables

Socio-demographic, economic variables: age, sex, residence, marital status, educational status, and monthly income.

Braden Risk Assessment Scale (RAS) factors; sensory perception, moisture, activity, friction /shear, mobility and nutrition.

Health facility related and other factors: length of hospital stay, supportive device, position change, bed ridden and BMI & Smoking.

#### 2.5.3. Operation Definitions and Terms of Definition

Bed sore: any lesion caused by unrelieved pressure resulting in damage of skin and underlying tissue of admitted patients.

#### 2.5.4. Data Management and Analysis

Data was coded and entered into to the Statistical Package

for Social Science (SPSS) version 20 and analysis was done. The data was presented in tables, graphs, and figures. Bivariate analysis was done and we selected those variables with p-value less than or equal to 0.25 to multivariate analysis.  $P < 0.05$  and AOR at 95% confidence interval were used to assess presence and strength of association between independent variable and dependent variable respectively.

### 2.5.5. Ethical Consideration

Ethical approval was obtained from research and ethical review committee of Wolaita Sodo University. Permission letter was given to WSUTRH administrations. We gave adequate information to all participants regarding the purpose, risk and benefit, and confidentiality of the study as described in the information. Participation was fully voluntary and informed written consent was obtained from each participant. This study was conducted according to declaration of Helsinki.

## 3. Results

### 3.1. Socio-Economic Characteristics

A total of 235 admitted patients to surgical ward of Wolaita Sodo University teaching and referral hospital participated in this study with the response rate of 99.15%. The study participants (aged 18-59 years, with the mean ( $\pm$  SD) age of 40.03 ( $\pm$ 12.276) were interviewed. Among study participants, 151 (64.3%) were male and 154 (65.5%) were urban dwellers. 57 (24.3%) of participants didn't attend any formal education, while only 11 (4.7%) had college and above education. 194 (82.6%) of the study participants were married and 97 (41.3%) were farmer. The category of average monthly income of the participants, 126 (53.6%) earned between <1500 ETB, and 109 (46.4%) earned more

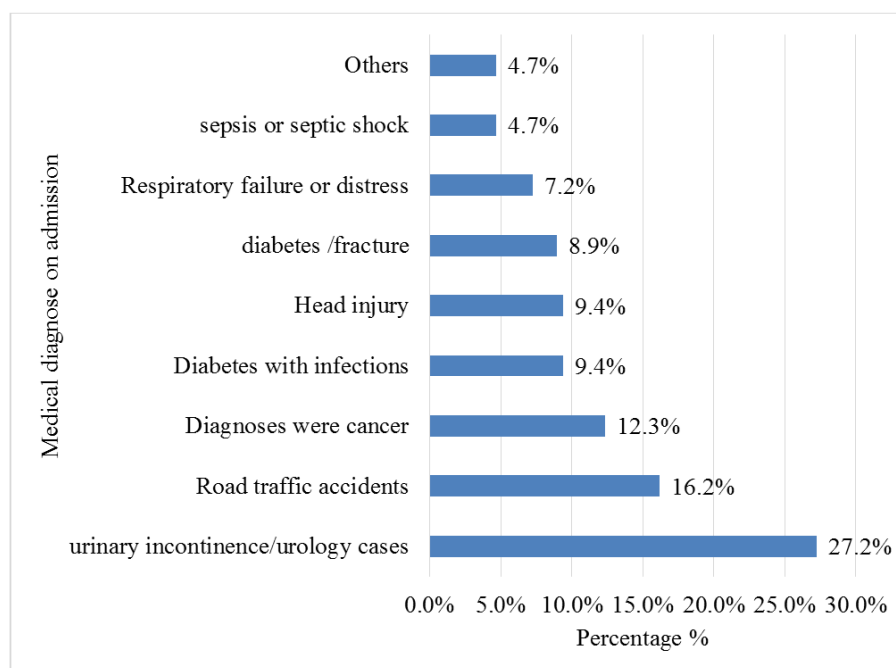
than 1500 ETB shown in table 1.

**Table 1.** Socio - Demographic and Economic characteristics among patients admitted at Surgical Ward of WSUTRH, Southern Ethiopia, 2019 (n=235).

Variable	Category	No.	%
Age in year	18-32	118	(50.2)
	33-53	87	(37.0)
	$\geq 54$	30	(12.8)
Sex of the respondent	Male	151	(64.3)
	Female	84	(35.7)
Residence	Urban	154	(65.5)
	Rural	81	(34.5)
Educational status	No formal education	57	(24.3)
	Read & write	48	(20.4)
	Elementary	71	(30.2)
	High school	48	(20.4)
marital status	College and above	11	(4.7)
	Single	23	(9.8)
	Married	194	(82.6)
	Divorced	7	(3.0)
Occupational status	Widowed	11	(4.7)
	Employed	33	(14.0)
	Self employed	34	(14.5)
	Not actively working yet	6	(2.6)
	Merchant	65	(27.7)
Monthly income in Ethiopian Birr	Farmer	97	(41.3)
	< 1500	126	(53.6)
	$\geq 1500$	109	(46.4)

### 3.2. Disease and Health Facility Related and Other Factors

The main reasons for admission among study participants during study period were urinary incontinence in 64 (27.2%), road traffic accidents in 38 (16.2%) and cancer in 29 (12.3%). While, 22 (9.4%) were admitted to diabetes with infections and head injury in figure 1.



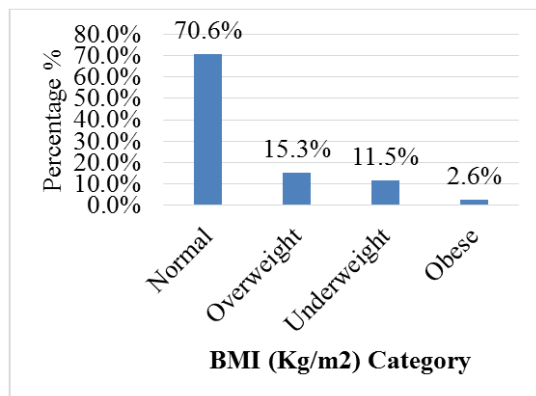
**Figure 1.** Medical diagnoses of patients admitted at Wolaita Sodo University Teaching and Referral Hospital in surgical ward, 2019.

Out of the 235 participants admitted at surgical ward, 6 (2.6%) and 8 (3.4%) were currently smoking and smoked previously, respectively. One third of the participants 70 (29.8%) were bedridden patients. Majority of the study participants 230 (97.9%) reported they were turned 4 times/day shown in table 2.

**Table 2.** Health facility related and other factors among patients admitted at surgical ward of WSUTRH, Southern Ethiopia, 2019 (n=235).

Variable	Category	No.	%
Smoke Cigarette	Currently smoking	6	(2.6)
	Previously smoke	8	(3.4)
	No smoke	221	(94.0)
The patient bedridden	Yes	70	(29.8)
	No	165	(70.2)
The patient gets position change service	Yes	87	(37.0)
	No	148	(63.0)
How often the patient gets position change service	Every 2 to 3 hours	3	(1.3)
	Every 4 hours	2	(.9)
	Turned 4times/day	230	(97.9)

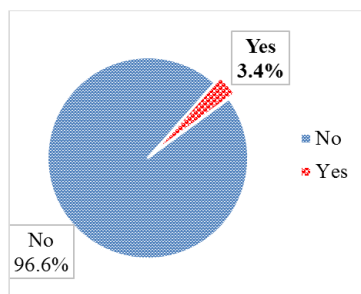
Regarding to the BMI, 166 (70.6%) had normal weight. While, 27 (11.5%) were Underweight, 36 (15.3%) overweight and 6 (2.6%) were obese shown in figure 2.



**Figure 2.** The nutritional status of the patients admitted in surgical ward at WSUTRH in Surgical Ward, Southern Ethiopia, 2019 (n=235).

### 3.3. Magnitude of Bedsore

The Magnitude of bed sore among patients admitted at surgical ward of Wolaita Sodo University Teaching and Referral Hospital during study period was 8 (3.4%), 95%CI: (1.6, 6.3) as shown in figure 3.



**Figure 3.** The prevalence of bed sore among patients admitted at WSUTRH in Surgical Ward, Southern Ethiopia, 2019 (n=235).

Out of the 8 (3.4%) who had developed bedsore, half of the participants 4 (50.0%) were stage I and mainly affected anatomical location of pressure ulcer was 4 (50.0%) were Sacral. The length of stay reported was mainly  $\leq 7$ days and 8-15 days shown in table 3 below.

**Table 3.** Bed sore related factors among patients admitted at Surgical Ward of WSUTRH, Southern Ethiopia, 2019 (n=8).

Variable	Category	No.	%
The stage of bedsore	Stage I	4	(50.0)
	Stage II	1	(12.5)
	Stage III.	1	(12.5)
	Stage IV	1	(12.5)
	Unstageable	1	(12.5)
The anatomical location of bedsore	Sacral	4	(50.0)
	Greater trochanter	1	(12.5)
	Shoulder	1	(12.5)
	Elbow	1	(12.5)
	Other	1	(12.5)
Length of stay	$\leq 7$ days	3	(37.5)
	8-15 days	3	(37.5)
	$\geq 16$ days	2	(25.0)

### 3.4. Braden Risk Assessment Scale (RAS)

Among 8 (3.4%) patients who had developed pressure ulcers or bedsore, no complete impairment in sensory perception was reported, while, 4 (50.0%) participants reported slight limitation and 3 (37.5%) were very limited. Concerning moisture, 2 (25.0%), 3 (37.5%) and 2 (25.0%) were very moist, occasionally moist and rarely moist respectively. Patients with bedsore, 4 (50.0%) walked occasionally, 4 (50.0%) were probably due to inadequate nutrition and 5 (62.5%) reported friction and shear as cause of bed sore development shown in table 4.

**Table 4.** Braden Risk Assessment Scale (RAS) factors among patients admitted at Surgical Ward of WSUTRH, Southern Ethiopia, 2019 (n=8).

Variable	Category	No.	%
Sensory perception	Very limited	3	(37.5)
	Slightly limited	4	(50.0)
	No impairment	1	(12.5)
Moisture	constantly moist	1	(12.5)
	Very moist	2	(25.0)
	occasionally moist	3	(37.5)
	rarely moist	2	(25.0)
	Bedfast	1	(12.5)
Activity	chair fast	2	(25.0)
	walks occasionally	4	(50.0)
	walks frequently	1	(12.5)
Mobility	Very limited	3	(37.5)
	slightly limited	3	(37.5)
	No limitation	2	(25.0)
Nutrition	Very poor	3	(37.5)
	probably inadequate	4	(50.0)
Friction and shear	Adequate	1	(12.5)
	Problem	3	(37.5)
	potential problem	5	(62.5)

### 3.5. Factors Associated with Bedsore Among Admitted Patients

Variables whose p-value less than 0.25 became candidate for

multivariate analysis. In bivariate analysis, age in year, monthly income in Ethiopian birr, residence, educational status, the patient bedridden and the patient get position change service became candidate for multivariate analysis.

In multivariate analysis, age in year, residence and the patient bedridden were variables with p-value of less than 0.05. Specifically, patients aged 54 and above years had significant association with the prevalence of bed sore with had

AOR=11.843 at 95 CI (1.052, 133.259). The study participants who were from rural area were more likely to develop bed sore when compared with urban dwellers (AOR=6.639 at 95 CI (1.09, 40.58)). Being the bedridden patient had significant association with the prevalence of bed sore (AOR=7.82 at 95 CI (1.265, 48.377)) as described in table 5.

**Table 5.** Bivariate and multivariate analysis result of prevalence of bed sore and associated factors among patients admitted at Surgical Ward of WSUTRH, Southern Ethiopia, 2019.

Variables	Category	Bedsore		COR (95%CI)	AOR (95%CI)	P-Value
		Yes	No			
Age (years)	18-32	2	116	1	1	
	33-53	3	84	2.07 (0.34, 12.67)	2.88 (0.39, 21.20)	0.299
	≥54	3	27	6.44 (1.03, 40.48)	11.84 (1.05, 13.26)	0.045*
Income (Eth. Birr)	< 1500	6	120	2.68 (0.53, 13.54)	1.73 (0.27, 11.22)	0.565
	≥ 1500	2	107	1	1	
Residence	Urban	3	151	1	1	
	Rural	5	76	3.31 (0.77, 14.22)	6.64 (1.09, 40.58)	0.040*
	Illiterate	1	56	1	1	
Educational status	Read & write	1	47	1.19 (0.07, 19.57)	1.22 (0.06, 23.68)	0.90
	Elementary	2	69	1.62 (0.14, 18.37)	2.015 (0.16, 25.44)	0.588
	High school	2	46	2.44 (0.21, 27.71)	4.86 (0.31, 76.65)	0.261
	College and above	2	9	12.44 (1.02, 151.84)	7.14 (0.38, 135.09)	0.191
Bedridden	No	2	163	1	1	
	Yes	6	64	7.64 (1.50, 38.85)	7.82 (1.27, 48.38)	0.027*

## 4. Discussion

The magnitude of bed sore among patients admitted at surgical ward of Wolaita Sodo university teaching and referral hospital during study period was 8 (3.4%), 95%CI (1.6, 6.3). This finding goes in line with study conducted in the prevalence of bed sore among patients admitted was 3.4% at Debre Markos Referral Hospital, East Gojjam Zone, Ethiopia [37].

The magnitude of bed sore in this study was lower than studies done in in Brazil [31], Turkey [32], and Germany [33] with magnitude of 12.7%, 10.4%, and 11.7%, respectively. The magnitude of bed sore was also lower than the study conducted in Sweden (22.9%) [34], Italy (27%)[35], Thailand (47.6%) [36], and Felege Hiwot referral hospital Ethiopia (16.8%)[15]. This difference might be due to increasing number of aging population that admits for long-term care in developed countries. In addition, this might be due to different characteristics of participants, disease condition of patients and length of stay in hospital.

Concerning factors, patients aged 54 and above had significant association with the occurrence of bed sore when compared with participants who are younger in age. This finding is similar with the study report on age showed a significant association with prevalence of bed sore in King Abdulaziz University Hospital [23], Atlantic salmon [24], [39]. This might be due to advancing in age may limited mobility, cause poor nutrition, accompanying co-morbidities, incontinence, impaired sensory perception, altered tissue perfusion, organ system failure, and infection and extrinsic factors like force and duration of pressure, shearing, friction

and macerations. Addition to that, it may due to advancing in age of participants may expose to the bed sore because of decreased functioning of nervous system.

The study participants who live in rural area were six times more likely to develop bed sore when compared with urban dwellers. This study result is similar with the study finding in Thailand Thai stroke patients [36]. They might lack full information and advice about care of dependent patients and prevention of bed sore development.

The odds of occurrence of bed sore were high among bedridden patient when compared with their counterparts. This study finding was similar to the finding of the study conducted in Debre Markos Referral Hospital, East Gojjam Zone, Ethiopia [37] and conducted in Jimma University Medical Center, Southwestern Ethiopia [38]. This might be due to their inability to care for themselves and staying in the same position for longtime which causes compression of blood vessels, nerve endings and damage skin tissues.

## 5. Conclusion and Recommendation

The magnitude of bed sore among patients admitted at hospital in surgical ward was medium. Advancing of age, rural residence and being bedridden patient were factors associated with the occurrence of bed sore. Therefore, frequent positioning of the patient and health education for patients from rural areas and special and frequent care for those unable to care for themselves were needed to minimize occurrence of bed sore. Future studies shall consider qualitative methods.

## Ethics Approval and Consent to Participate

This study was conducted in accordance with declaration of Helsinki that provides guidance for researcher to protect research subjects. Study was approved by Institutional research review committee of Wolaita Sodo University. Then, the participants were informed as the participation is voluntary basis and about benefits and harms of participation. Informed written consent is obtained from participants before data collection.

## Consent to Publish

All Authors agreed to public this original research work.

## Conflicts of Interest

The authors declare that they have no competing interests.

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