

Prevalence of Pressure Ulcer and Associated Factors Among Hospitalized Adult Patients in Public Hospitals Sidama Zone, South Nations, Nationalities, and Peoples' Regional State, Ethiopia, 2017.

AAbiru Neme^{1}, Wadu Wolancho¹, Gugsu Nemera¹, Yosef Yohanes²

¹Jimma University, Institute of Health, School of Nursing, Ethiopia

²Hawassa Health Sciences College, South Nations Nationalities, and Peoples' Regional, Ethiopia

Abstract

Background: On average, 60,000 people die each year worldwide due to pressure ulcer related causes. Even though, few studies reported the prevalence of pressure ulcer in some part of Ethiopia, there is paucity of information on the other side.

Objectives: To Assess prevalence of Pressure Ulcer and Associated Factors Among Hospitalized Adult Patients in Public Hospitals in Sidama Zone; South Nations Nationalities, and Peoples' Regional State, Ethiopia, 2017.

Methods: Institution based cross sectional study design was employed to assess pressure ulcer prevalence and associated factors in Sidama Zone from March 13-April 12, 2017, On 356 subjects. Multistage sampling technique was employed to reach individual study subjects. Data was entered into EPI- data version 3.1 and was analyzed by using SPSS version 20 statistical software. Descriptive statistics, Bivariate and multivariate logistic regression were computed to assess statistical association using Odds Ratio. Significant of statistical association was assured or tested using 95% confidence interval and p value (<0.05).

Results: A total of 56 Patients were Develop pressure ulcer from 356 admitted in Public Hospitals, with the prevalence rate of 15.7 %; from which 6 (1.7%), 34 (9.6%), and 16 (4.5%) were Medical Device Related Pressure Ulcers and Routine Pressure Ulcers. Patient who had No Position change by nurse were 4.53 times (95% CI: AOR, 4.346 (1.646 – 11.473; P= 0.003) more likely to develop Pressure ulcer than Participants who had position change. Patients who had Body mass index Less than 18.5 kg/m² were 6.9 times (95% CI: AOR, 6.91 (1.307,36.554) more likely to develop pressure ulcers than Patients who had BMI in between 25-29.99kg/m².

Conclusion and Recommendation: The Overall prevalence of pressure ulcer on this study is high. Position change, Activity, mobility, moisture, Antimicrobial, and ant diabetic were significantly associated with the development of pressure ulcer; Sidama Hospitals should Perform Risk and comprehensive assessment for all patients as soon as possible after admission, Provision of training for Nurses on Manual handling techniques when positioning and transferring patients, and if ,health condition patients permit nurses should reposition patient every two hours.

Keywords: Pressure ulcers, Risk factors, Prevalence, Sidama Zone.

Accepted on August 18, 2020

Introduction

A pressure ulcer is a localized injury to the skin and/or underlying tissue usually over a bony prominence, because of pressure, or pressure in combination with shear and/or friction [1-3]. Pressure ulcer also known as bed sore, pressure sore and decubitus ulcer [4].

Prolonged pressure impede capillary and venous return thus limit the delivery of oxygen and nutrients to tissue resulted with Metabolic wastes accumulation causes local vasodilatation [5,6], which contributes to edema compresses small vessels and ischemia prone patients at risk for pressure ulcer development [7,8].

Each year thousands of patients die of it and millions suffering

from it in USA alone [9-13]. The number of patient suffering from PU is a few as 7.3% in hospitals in Europe and as high as 23% in North America [14-17], and 15.5% Malaysia [18-21].

Study reports in Africa revealed comparable magnitudes of pressure ulcer. In Nigeria it ranged from 3.22% to 18.6 % [4, 22]; whereas in Ethiopian hospitals it ranges from 13.4% to 16.8 % [23, 24].

A multicenter study in Brazil, prevalence of PU was 16.9%. Of which 16.3% patients had more than three PU [25]. Based on anatomical location; Sacral 82.5%, trochanter 37.5%, calcaneus 27.5%, Lumbar 6.3% and elbow 3.7% were the most affected. Whereas Patients presented with stage I 30.3 %, stage II 32.9 %, stage III 22.8 % and IV 13.9 % [26].

Pressure ulcer prevalence was 9% Study in the Republic of Ireland whereas 83% of the pressure ulcers were located on the sacrum. In terms of grade 33% were classified as grade II; but 24% were grade IV [20].

Cross-sectional study from different hospitals in Norway prevalence was 24 %. Stage I comprised most pressure ulcers, and the sacrum, ischial tuberosity, and heels, were the most common sites. Other ulcers were located on the feet, ears and back [25].

Cross-sectional survey in one university hospital and 11 general Hospital in China; prevalence was 1.58%, age of patients 40-69 was almost half of study participant. Whereas 27.54% were aged over 70 years; the age of people with highest prevalence of pressure ulcer was more than 89 years. 52% of the pressure ulcers occurred in participants whose age between 70-89 years. Based on anatomical locations; Sacrum 60.22%, iliac crest 8.72%, heel 7.45%, trochanter 6.34%, ankle 4.91%, scapula 3.33%, ischial tuberosity 3.01%, Shoulder joint 0.79%, Elbow 0.79% and occiput 0.79% areas. Whereas stage I 28.68%, stage II 35.82%, stage III 12.68%, stage IV 12.99%, Unstageable 8.40%, and SDTI 1.43% [14].

Prospective observational study at the University of Malaya, Malaysia; prevalence of PU was 15.5%, of which 64.2% had a single pressure ulcer and 35.8% had pressure ulcers at more than one site. Stages Were, 64.2% stage II, 13.1% stage III, and 22.6% stage IV. Anatomical location: 72.3% were at the sacrum, 13.9% were at the trochanter and 13.9% were situated at the heel [21].

Survey in Nigeria in among 129 bed-ridden patients' prevalence of Pressure ulcer was 18.6%; majority of patients with PU were male 91.7% and 8.3% female. Majority of patients who had pressure ulcer were the elderly patients above 65years 37.5% and those in the age range of 51-57 years 25%. Stages of Pressure were noted to be highest for Stages III 37.5%, and Stage IV 33.3%, and then low in Stage II 20.8% and Stage I 8.3%; location of pressure ulcers buttocks and sacrum 50% and 33.3% respectively [4]. Another study in the six university hospitals Nigeria, prevalence of PU was 3.22%, prevalence in the university hospitals ranged from 0% to 6.9%. The patients with a pressure ulcer were aged 16 to 86 years with a mean of 47.04±21.23 years. Prevalence rate based on gender; male and female patients were 3.59% and 2.83% respectively, whereas based on anatomical distribution 69.3% of the ulcers: ischium/buttocks 43.6%; sacrum/coccyx 18.0%; and heel 7.7% [22].

Cross-sectional study in Ethiopia, Prevalence of pressure ulcer was 16.8%; higher in male respondents 42% than in female 29%. Based on Stages PU, stage I 62%, stage II 26.8% and stage IV 2.8%. From that developed pressure ulcer, most of the participants 70.4% developed sacral area and 10% patients at both sacral and shoulder area [23]. Another study in Wolaita Sodo Hospital Prevalence of pressure ulcer was 13.4%, higher among male Participant than female.

A cross-sectional survey study from 1100 patients, in the Republic of Ireland, 77% of the study participants was low risk of pressure ulcer development. However, individual scale of the Braden identified 53.5% were either completely immobile or had very limited mobility. Also, 51% was chair-fast and 7%

bed-fast. 49% was incontinent of urine and feces, 78% having an adequate or an excellent nutritional status, of those with pressure ulcers [20].

A cross-sectional study in Norway different hospitals and community care sites, 32% were at risk for PU, There was a statistically significant association between having a pressure ulcer and being at risk using Braden (cut-off 18) ($p < 0.001$) [25].

Cross-sectional study in six long-stay institutions for the elderly in São Paulo, the Braden scale scores ranged from 7 to 19. According to the Braden scale, 67.5% of the patients were at high risk of pressure ulcer development [27].

Cross sectional point prevalence study in USA pressure ulcers was 5.4%. Of which 1.4% patients had at least one MDR pressure ulcer. The proportion of patients with hospital-acquired ulcers related to medical devices was 34.5%. Whereas Most MDR HAPUs were stage I 35%, stage II 32% however; it is important to note that 24% were unstageable and 3% were stage III, a full thickness ulcer. The most common locations of MDR HAPU were the ears 35%, lower leg 11% and heels 8% [19].

Study of two major metropolitan hospitals in Saudi Arabia in 84 patients, 33 patients was identified giving a HAPU incidence of 39.3%. A total of 41 HAPUs were recorded in 33 patients. The overall incidence of MDRPU was 8.3%. From the 41 HAPUs, 20% were related to medical devices, and the most common site was the ear 37.5% [28,29]. As to my knowledge Prevalence of medical device related pressure ulcer study was not done in the study area.

A cross-sectional study in South-Eastern Norway, There was no gender difference between patients with and without PUs ($X^2 = 0.862$, $p = 0.353$); however, age 70 or above ($X^2 = 70.347$, $p < 0.001$) differed significantly [7].

A cross-sectional study in Republic of Ireland, from completely immobile or had very limited mobility and chair-fast or bed-fast. Both factors to be statistically significantly associated with pressure ulcer development ($\chi^2 = 31.298$, $p < 0.0001$; $\chi^2 = 40.467$, $p < 0.0001$, respectively). The association between pressure ulcers and nutritional status was noted to be statistically significant ($\chi^2 = 9.409$, $p = 0.024$). This association counters intuitive as it suggests that as nutritional status increases, so too does the number of pressure ulcers. Mobility and moisture are the highest predictors of pressure ulcer development and was statistically significant ($\beta = -0.202$, 95% CI = -0.100 to -0.023; $p = 0.002$; $\beta = -0.121$, 95% CI = -0.015 to -0.099; $p = 0.008$), respectively [20].

A cross-sectional study in Norway, there was a statistically significant association between having a pressure ulcer and being at risk using Braden (cut-off 18) ($p < 0.001$) [25].

Study in Kuala Lumpur Malaysia, from October 2012 to May 2013, Braden score ≤ 12 were 1.9 times (95% CI: 1.14, 3.19) more likely to develop pressure ulcer than those Braden score > 12 [21].

A community based cross-sectional study, Ethiopia, patient slightly limited in sensory perception, were 3.3 times (95% CI: 1.39, 7.75) at higher risk to develop pressure ulcer than those

who had no impairment in sensory perception. And problem in friction and shearing forces were 4.5 times (95% CI: 1.56, 12.93) more likely to develop pressure ulcer than those who had no apparent problem [23].

Cross sectional study in Wolaita Sodo teaching hospital; patients with very limited sensory perception, friction and shearing and bedbound in activity were (AOR: 2.773; 95% CI: 1.244-4.64; $P < 0.05$), (AOR: 2.28; 95% CI: 1.85-15.79; $P < 0.05$), and (AOR: 2.34; 95% CI: 3.24- 4.13; $P < 0.05$) respectively significant predictors of Pus [24].

Study among 84 Participants adult intensive care unit Saudi Arabian, the result illustrated infrequent repositioning were (AOR: 250.04; 95% CI: 5.230–11 954.16; $P = 0.005$) significant predictors of all stages of Pus [29].

Cross-sectional study among 422 hospitalized patients in Felegehiwot referral hospital, Ethiopia; position change was not significantly associated with PU in multivariate logistic regressions [23].

Multicenter, cross-sectional, study in hospitals in different geographic regions of Brazil, the result depicted that a length of stay in hospital stay between 8 days to 15days significant association with PU (OR 3.85; 95% CI: 1.53-9.73; $P < 0.05$) [26].

prospective observational study in Kuala Lumpur, the result Shows that Individuals with hospital acquired pressure ulcers had significantly longer duration of hospitalization (median [IQR] = 22 [12.75–34.50] vs. 15 [10.25–23] days; $P = 0.032$) [21].

Study done in two major metropolitan tertiary care hospitals Saudi Arabia; Length of stay in the ICU significant association with PU (OR: 1.23; 95% CI: 1.087–1.392; $P = 0.001$) [29].

Cross-sectional study in Felegehiwot referral hospital Ethiopia, length of stay in hospital greater than or equal to 21days was strongly associated with pressure ulcer development, 95% CI, AOR, 5.97(1.98,18.00) [23].

a population-based study from 15 general and tertiary care hospitals, in USA the result depicted that, Patients with BMI (in kg/m²) < 19 reported a higher risk of PU (OR=3.07; 95% CI: 2.41, 3.91), but a lower risk in the BMI 25–30 (OR= 0.65; 95% CI: 0.53, 0.80) and ≥ 30 (OR= 0.52; 95% CI: 0.42, 0.64) [30].

study at a large private general hospital located in São Paulo, the results from the statistical analysis BMI and the development of PU were not statistically significant ($p > 0.05$) [31].

Study in University Hospital João Pessoa, Brazil; PU statistically not associated with presence of Edema ($p > 0.005$) [2].

The sectional, quantitative study in University Hospital João Pessoa, Brazil; PU was statistically associated with the level of consciousness ($p = 0.004$) [2].

Cross sectional study in Wolaita Sodo Hospital south Ethiopia; PU significantly associated with Diabetes (AOR=4.116;95% CI=2.135,6.884) [24].

Method and Materials

Study Setting

5

The study was conducted in public hospitals sidama Zone, from March13-April 12, 2017

Sidama zone is bordered in the south with Oromia region and Gedeo, in the West Bilate River which separate from North omo, and in the north and East by Oromia region. The administrative center for Sidama Zone is Hawassa; another town Includes Yirgalem, Wendo Genet, and Chuko. Hawassa is Located at the eastern shore of Lake Hawassa 276 KM south of Addis Abeba. Sidama zone has a population of 3,232,306 people in 23 districts with three city administrations. There were eleven hospitals found in sidama zone around 994 health care professionals [32].

Hawassa University comprehensive specialized Hospital (HUCSH), has 400 beds average of 65,000 peoples seen per year. This teaching hospital has 341 health care workers. In terms of Human power senior Physicians, General practitioners, Pharmacist, Laboratory Technicians, Nurses & Radiographers of 36, 30, 25, 32, 209 & 9, respectively.

Adare General Hospital is found center of the city under Hawassa city administration which is up graded from health center in 2004 EC and it has limited health professionals and hospital setting. has 131 beds, total of 365 Human power which includes 34 Nurses BSc, Nurses Diploma 83, Health Officer 6, General practitioners 22, Senior Physicians 4, Pharmacist 8, Pharmacy Technician 9, Lab technician 12, Lab technologist 12, Radiologist 1, and X-Ray technician 6.

Yirgalem General Hospital is found in sidama zone Dalle District, was built 1958 E.c by Norwegian king IV the total bed of the hospital 171, with total of 287 Human power, 60 Nurses, health officer 5, General practitioners16, Senior Physicians 8, Clinical Pharmacist 2, Pharmacist 8, Pharmacy technician 19, and X-Ray Technician 6.

Leku Hospital it is primary hospital, found in sidama zone Shebedino District, with the total of 66 bed, 149 Human power which includes 52 Nurses, Midwives 11, Health Officer 5, GP 8, Lab Technologist and Lab technicians 12, Pharmacist 3, pharmacy technician 4, and x-ray technician 2.

Study design

Institution based cross sectional quantitative study design was employed to determined prevalence of pressure ulcer and to identify factors with Pressure ulcers in Public Hospital in Sidama Zone

Population

Source Population

All hospitalized patients in public hospitals, Sidama Zone.

Study Population

Sampled adult patients who were admitted in Medical, Surgical, Obs/Gyn, & ICU Wards in selected public hospitals in sidama Zone

Study Unit

Individual patients who were admitted on beds medical, surgical, Oby/Gyn & ICU wards

Inclusion and exclusion criteria

Inclusion Criteria

Adult Patients who were admitted in Medical, surgical, Oby/Gyn, and ICU Greater than or Equal to 24 Hours

Exclusion criteria

Patients who developed pressure ulcer before admission.

Sample size and Sampling technique

Sample size

Sample size was determined by using single population proportion formula; the prevalence of pressure ulcers 16.8%. which was taken from Haileyesus Gedamu et al. done at Felegehiwot Referral Hospital, Bahir Dar, Ethiopia [23].

(n) Sample size at a Z-value of 1.96 with 95% CI and d of 5%:

$$n = (z \alpha/2)^2 \rho(1-p)/d^2$$

Where,

Z= 1.96, the confidence limits of the survey result (value of Z at $\alpha/2$ or critical value for normal

distribution at 95% confidence interval).

P= 0.168, the proportion pressure ulcer

d= 0.05, the desired precision of the estimate

n= the total sample size.

$$n = (1.96)^2 \cdot 0.168(1-0.168) / (0.05)^2$$

$$n=214.8$$

$$n=215$$

Considering a 10% nonresponse rate, the total sample size

$$215 \times 10/100 = 21.5, 215+21.5=237$$

And calculating design effect (1.5) the final sample size was 356; Therefore, 356 patients was included in this study from selected public hospitals in sidama Zone Finally, the number of patients participating in each hospital was determined using the population proportionate sampling (PPS).

$$n = (nf \times N) / (N \text{ total})$$

Where, n = Proportion of patient participate in the study in each public hospital, nf = Final

sample size (356), N= is the number of patient beds in medical, surgical, Oby/Gyn and ICU of each public hospital; N total = Total number of patient beds in all selected public hospitals (412) i.e.

1. Hawassa comprehensive Specialized Hospital=159, = $356 \times 159/412 = 137$

2. Adare General Hospital=80, = $356 \times 80/412 = 69$

3. Yirgalem General Hospital= 135, = $356 \times 135 / 412 = 117$

4. Leku Hospital=38, = $356 \times 38/412 = 33$

Sampling technique

Multistage sampling technique was employed Simple Random

sampling (Lottery method) technique was employed to select four hospitals from eleven hospitals in sidama Zone; therefore Leku, Adare, Yirgalem and Hawassa comprehensive specialized hospital was selected [33,34].

Population Proportionate Sampling (PPS) was applied to get the total number of study participants from each hospital (Hawassa comprehensive Specialized Hospital 41, 46, 43, & 7 medical, surgical, Oby/Gyn & ICU wards respectively); Adare General Hospital 24, 28, & 17; medical, surgical & Oby/Gyn wards respectively; Yirgalem General Hospital 41, 49, 22 & 5; medical, surgical, Oby/Gyn & ICU wards respectively) and Leku Hospital 10, 10, and 13; medical, surgical and Oby/Gyn wards respectively.

Simple Random sampling (Lottery method) was employed again to obtain the individual participants from each ward by using Registration book as sampling frame obtained from case team leader as illustrated in (Figure 1).

Study Variables

Dependent Variable

- Pressure Ulcer

Independent Variables

- Socio demographic factors
 - Age
 - Gender
- Braden Risk Factors
 - Sensory perception
 - Moisture
 - Activity
 - Friction /Shear
 - Mobility
 - Nutrition
- Service-Related Factor
 - Position change
 - Length of stay in hospital
 - Drug Profile
 - Medical device related Factor
- Patient Related Factors
 - BMI
 - Edema
 - Level of Consciousness
 - Patient diagnosis

Data collection procedures

Participant information (such as age, Place of residence, Marital status, Educational status, Religion, Length of Hospital stay, and Evidence of prescribed turning position schedules, Edema, BMI, Presence of pressure ulcers) collected through interview,

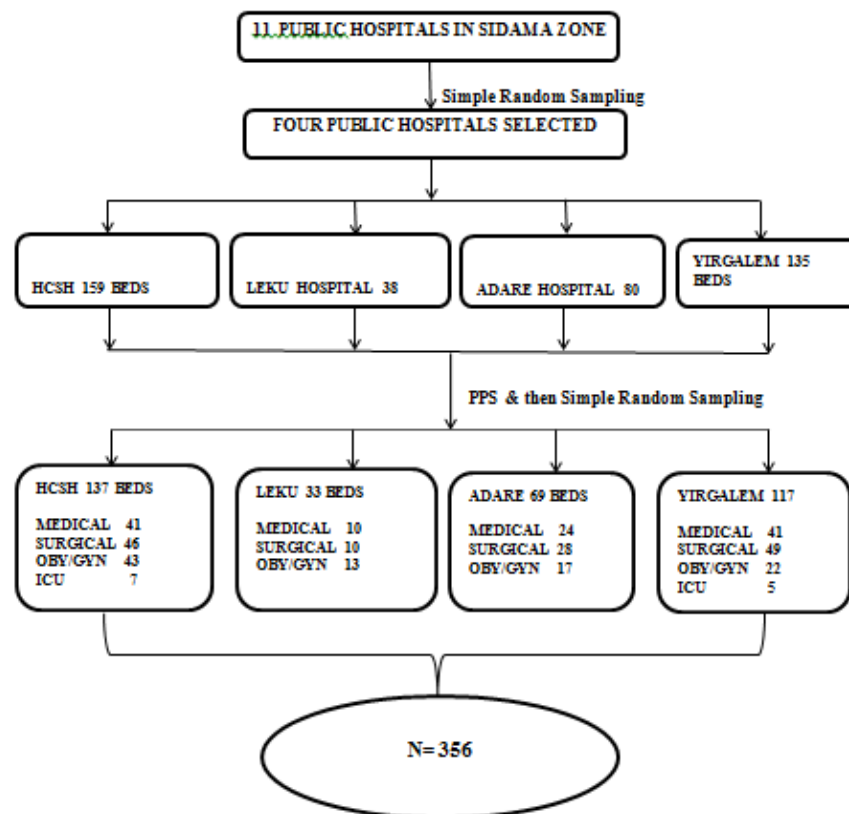


Figure 1. Schematic Presentation of Sampling Procedure for Prevalence of pressure ulcer and associated factors among Hospitalized Adult Patients in selected Public Hospitals in Sidama Zone, SNNPR, Ethiopia, 2017.

document review and physical examination techniques from head to toes. The tool is developed after reviewing different Literature [2,7,14,19,21,23,24] and the Braden Pressure Ulcer Risk Assessment Scale Adopted from Barbara J. Braden (33). The Structured Questionnaire contain three section part I, socio-demographic Question which contain 6 question, Part II , Patient and Service Related,17 question and Part III Braden risk assessment tool which has 6 item (sensory perception, skin moisture, activity, mobility, nutrition, and friction/shear[33], summated rating scale made up of five subscales scored from 1-4 and six subscale 1-3, for total scores that range from 6-23. With cutoff <17 risk for PU and no risk of pressure ulcer at Braden score ≥ 17 [14]. A lower Braden Scale Score indicates a lower level of functioning and, therefore, a higher level of risk for pressure ulcer development [34].

The data was collected by 6 trained Degree nurses and were supervised by 2 MSc nurses having previous experience in data collection. Continuous follow-up and supervision were performed by principal investigator throughout the data collection period.

Validity and Reliability

The Braden Scale has demonstrated a high degree of inter-rater reliability between 0.99 and 0.83. In terms of predictive validity, the Braden Scale has demonstrated sensitivities that range from 70% to 100% and specificities ranging from 64% to 90%. The tool has been shown to be equally reliable with Black and White patients [14,33,34].

Data analysis

The data was entered into EPI- data version 3.1, and then the data was edited, cleaned, and coded and analyzed by using Statistical Package for Social Science (SPSS) version 20 statistical software. Descriptive statistics: frequencies and percentages were done and presented in table, figure, and graph. Binary logistic regression was used to identify the statistical association between pressure ulcer and independent variables using, OR 95% CI and p-value of less than 0.25. Multiple logistic regression models were fitted to control the possible effect of confounders and finally the variables which had independent association with pressure ulcer was identified based on AOR, with 95%CI and p-value less than 0.05. The variables were entered to the multivariate model using the Backward LR regression.

Data quality control

Data quality was ensured during collection, coding, entry, and analysis. Training was given to the data collectors and supervisors to prevent any confusion and have a common understanding about the study. Pretest was conducted 10% of study participants at Dilla University Teaching Hospital; based on the pretest, questions were revised, edited, and those found to be unclear was removed by investigator. Supervision of data collectors and observation of how the data collectors were collected data was done by supervisors. The data collectors were instructed to write Medical record number on the Questionnaires during the data collection so that any identified errors were traced back using the Medical record number. The filled Questionnaires were checked for completeness by data collectors, supervisors, and Principal investigator daily.

Consequently, any problem encountered was discussed among the team and solve immediately.

Ethical consideration

Ethical clearance and approval for the study was obtained from institutional review board (IRB) of Jimma University, institute of health. An official letter of cooperation was given to Hawassa Comprehensive specialized hospital, Adare General Hospital, Yirgalem General Hospital, Leku primary Hospital, Dilla University Teaching Hospital (neighboring to study zone) and an official letter of permission was provided to the head of Medical, surgical and Oby/Gyn wards for the utilization of patient cards and to conduct physical examination. The purpose and importance of the study was explained to each study participants and written or oral consent was obtained from patients and/or relatives. To ensure confidentiality of participant's information, anonymous typing was applied whereby the name of the participant and any identified of participants were not be written on the questionnaire. Participant was interview and Examine alone to keep the privacy. Respondents who are not wasting to be involved in the study and those who want to stop interview at any time could do so. The instruments were translated from English into Amharic language, reviewed by a group of researchers for meaning, clarity and cultural appropriateness, and back translated into English for verification.

Dissemination Plan

The findings will be present to Jimma University, Institute of health, and Faculty of health science, School of Nursing, and midwifery. The copy of the result will be submitted to four public hospitals; also, I will try to disseminate through presentation on conferences and publication on scientific journals on local or international journals

Result

Socio-Demographic Data

A total of 356 admitted patients in Four Public Hospital were Participated in the study. Above half of study Participants 212(59.6%) were age between18-39 on the contrary 30(8.4%) were age between70-89.

Majority Participants, 267(75.0%), 230(64.6%), 218(61.2%) and 200(56.2%) were married, rural residents, females in Gender and Protestant in religion, respectively. In addition, 112 (31.5%) of the respondents were not educated (see table1).

Patients and services related information

Majority patients 309 (86.8%) who admitted in four Public Hospitals in sidama Zone were stayed more than or equal to 6 days; meanwhile 47(13.2%) had stayed in Hospital less than 6

Table 1: Socio demographic Data of the Participants of Public Hospitals in Sidama Zone, SNNPR, Ethiopia, 2017 (N=356).

Variables	Frequency (n)	Percent (%)
Numbers of Participants		
Hawassa Comprehensive Specialized Hospital	137	38.5
Adare General Hospital	69	19.4
Yirgalem General Hospital	117	32.9
Leku Primary Hospital	33	9.3
Participants Age		
18-39 Age	212	59.6
40-69 Age	114	32.0
70-89 Age	30	8.4
Place of Residence		
Urban	126	35.4
Rural	230	64.6
Sex of Patients		
Male	138	38.8
Female	218	61.2
Religion of patients		
Protestant	200	56.2
Orthodox	92	25.8
Muslim	57	16.0
Catholic	7	2.0
Marital Status		
Single	82	23.0
Married	267	75.0
Divorced	5	1.4
Widowed	2	0.6
Educational Status		
No education	112	31.5
Only read and write	52	14.6
1-8 Grade	106	29.8
9-12 Grade	54	15.2
12+ Grade	32	9.0

days.

Majority of study Participants 135(37.9%) were admitted in Surgical ward, 113 (31.7%) in medical ward and 12(3.4%) in ICU.

Majority of the patients 290(81.5%), 225(63.2%), and 160(44.9%) were conscious, had no turning position Schedule, and BMI between 18.5-24.99kg/m², respectively.

Majority of Patients 310 (87.1%), 347(97.5%), and 131(36.8) were Used Medical device, patient with medication and Patient diagnosis with Sepsis, Respectively (table 2).

Braden risk assessment scale Information

Out of the total Participants 118 (33.1%) had slightly limited in sensory perception, and 69 (19.4%) of participants had Occasionally Moist. From the total participants 52 (14.6 %) were completely immobile. 229 (64.3%) participants were probably inadequate in nutrition, and 168 (47.2%) of the patients had problem in Friction & Shear (table 3).

Prevalence of Pressure Ulcers

A total of 56 (15.7%) patients were developed pressure ulcer from 356 who were admitted in four public Hospitals in Sidama

Zone; Out of the overall prevalence Hawassa comprehensive Specialized Hospital, Yirgalem Hospital, Adare Hospital, and Leku Hospital were accounts 16.8% (23), 16.2% (19), 15.9%(11), and 9.1% (3) respectively (see figure 2).

Out of those who developed PU 34(9.6%), 16(4.5%), and 6 (1.7%), and were due to Routine, Both Types, and MDRPU respectively (see figure 3).

Prevalence Medical device related pressure ulcers

The Overall Prevalence Pressure ulcers was 56 (15.7%) from which MDRPU which account 6 (1.7%). From this; Hand and Lips 3 (50%), leg 2(33.3%), and Nose, Ear and Neck 1(16.7%). Based on EPUAP stage 3(50%) were stage I and 3(50%) stage II.

Pressure Ulcer and Socio-Demographic Data

Patients age between 40-69 and 70-89 pressure ulcer were more prevalent 27(23.7%) and 5(16.7%) respectively. Majority of Patients who developed Pressure ulcers were not educated and between grades 1-8. The prevalence of pressure ulcer was higher in male respondents 27(19.6) than in female respondents 29(13.3%). The reason might be male were low fat composition than female (table 4).

Table 2: Patients and Services Related Information of the Participants in Public Hospitals in Sidama Zone, SNNPR, Ethiopia, 2017 (N=356).

Variables	Frequency (n)	Percent (%)
Length of Hospital Stay		
<6 Days	47	13.2
>=6 Days	309	86.8
Patients Ward		
Medical	113	31.7
Surgical	135	37.9
Gynecology	96	27
ICU	12	3.4
Level of consciousness		
Unconscious	66	18.5
Conscious	290	81.5
Evidence of turning Position		
No	225	63.2
Yes	131	36.8
Patient Body mass index		
<18.5kg/m ²	134	37.6
18.5-24.99kg/m ²	160	44.9
25-29.99kg/m ²	62	17.4
Patient with Medical device		
No	46	12.9
Yes	310	87.1
Patient with Medication		
No	9	2.5
Yes	347	97.5
Patient Diagnosis		
Diabetes Mellitus	20	5.6
Sepsis	131	36.8
Respiratory Disease	22	6.2
Anemia	19	5.3
Hypertension	22	6.2
Heart Disease	8	2.2
Stroke	5	1.4
Fracture	15	4.2

Table 3: Braden Scale Pressure Ulcer Risk Assessment of the Participants in Public Hospitals in Sidama Zone, SNNPR, Ethiopia, 2017 (N=356).

Variable		Frequency	Percentage
Sensory perception	Completely limited	40	11.2%
	Very limited	38	10.7%
	Slightly limited	118	33.1%
	No impairment	160	44.9%
Moisture	Constantly moist	2	0.6%
	Very moist	5	1.4%
	Occasionally moist	69	19.4%
	Rarely moist	280	78.7%
Activity	Bedfast	119	33.4%
	chair fast	67	18.8%
	walks occasionally	96	27%
	walks frequently	74	20.8%
Mobility	completely immobile	52	14.6%
	very limited	90	25.3%
	slightly limited	167	46.9%
	no limitation	47	13.2%
Nutrition	very poor	76	21.3%
	probably inadequate	229	64.3%
	Adequate	40	11.2%
	Excellent	11	3.1%
Friction and shear	Problem	168	47.2%
	potential problem	125	35.1%
	no apparent problem	63	17.7%

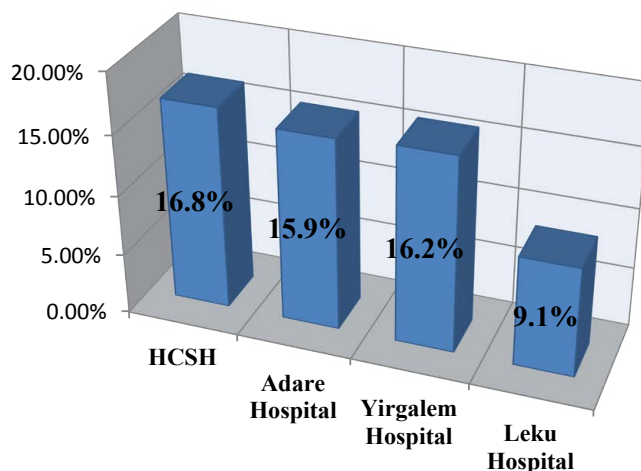


Figure 2. Distribution of Pressure Ulcer Prevalence in Public Hospitals in Sidama Zone, SNNPR, Ethiopia, Ethiopia, 2017.

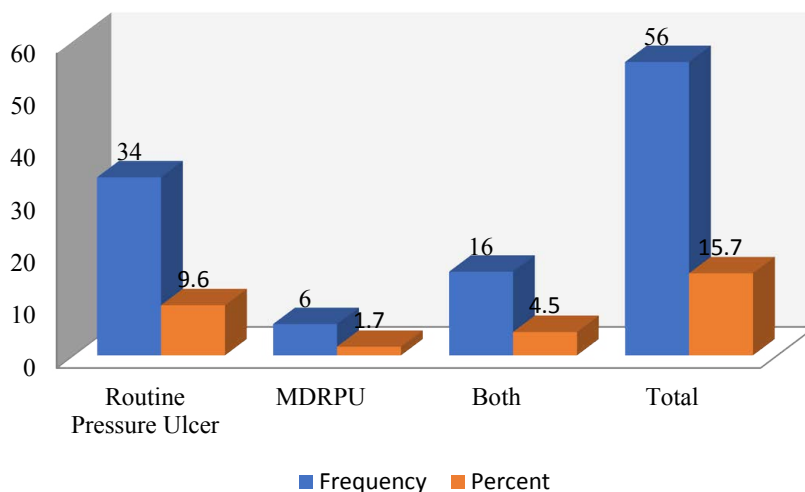


Figure 3. Types of pressure ulcer distribution among study Participants Public Hospital in Sidama Zone, SNNPR, Ethiopia, 2017.

Table 4: Prevalence of Pressure Ulcer and Socio-Demographic Data of the Participants in Public Hospitals in Sidama Zone, SNNPR, Ethiopia, 2017 (N=356).

Variables		Patients develop pressure Ulcer			
		NO		Yes	
		No	Percent (%)	No	Percent (%)
Patient Age	18-39	188	88.7%	24	11.3%
	40-69	87	76.3%	27	23.7%
	70-89	25	83.3%	5	16.7%
Sex	Male	111	80.4%	27	19.6%
	Female	189	86.7%	29	13.3%
Residence	Urban	105	83.3%	21	16.7%
	Rural	195	84.8%	35	15.2%
Education	No Education	92	82.1%	20	17.9%
	Only Read & write	49	94.2%	3	5.8%
	1-8 grade	86	81.1%	20	18.9%
	9-12 grade	43	79.6%	11	20.4%
	12+	30	93.8%	2	6.2%

Pressure Ulcer with Patients and services related Variables

Majority of admitted patient in Public Hospital 160(44.9%) of them were BMI in between 18.5-24.99 kg/m² and pressure ulcer more prevalent 33(24.6%) of BMI <18.5kg/m². 309(86.8%) admitted patients were greater than or equal to six-day length of Hospital stay; from which 55(17.8%) of the Participant develop pressure ulcers. 276 (77.5%) of patient have no edema; 21(26.2%) Patient develop pressure ulcer with Edema.

Majority of the patient admitted in Public hospitals 250 (86.2%) were conscious; the prevalence of pressure ulcer 16(24.2%) increased in unconscious patients. Majority of hospitalized patients 225(63.2%) had no evidenced position change schedule; and from those no position changes 44(19.6%) of them develop pressure ulcers.

Majority of patients 135(37.9%) were admitted in surgical ward; the least were 12(3.4%) in ICU and which was the most prevalent Unit in the Wards (table 5).

Anatomical Location and Stages of Pressure Ulcer

Based on EPUAP grading scale; 21(5.9%), 26 (7.3%), 4 (1.1%), and 5(1.4%) patients developed stage I, stage II, stage III, and stage (stage IV) pressure ulcer, respectively. In terms of anatomical location 20(5.6%), 16(4.5%) were developed pressure ulcer on Sacral area and Shoulder, respectively. 7(2.0%), 4(1.1%), were at Hand& lips and heel area, respectively (table 6).

Factors Associated with Pressure Ulcer

Independent variables analyzed in logistic regression with Outcome variable of pressure ulcer to identify their association. Those variables which were significant at ≤ 0.25 entered multiple logistic regressions. A multiple logistic regression identified that Position change; BMI, Activity, mobility, moisture, Antimicrobial, and ant diabetic were significantly associated with the development of pressure ulcer.

Study Participants who had No Position change schedule were 4.34 times (95% CI: AOR, 4.346 (1.646 – 11.473; P= 0.003) more likely to develop Pressure ulcer than Participants who

had position change. Those participants who had Body mass index of Less than 18kg/m² were 6.9 times (95% CI: AOR, 6.912(1.307,36.554) more likely to develop pressure Ulcers than Patients who had BMI in between 25-29.99kg/m².

Participants who had occasionally Moist were 4.7 times (95% CI: AOR, 4.734(1.999, 11.234) more risk to develop Pressure ulcer than those rarely Moist skin. Patients who were bed fast in activity 13.4 times (95% CI: AOR, 13.365(1.622, 110.138) more risk to develop Pressure Ulcer than those who walks frequently.

Those participants who had very limited in Mobility were 10.7 times (95% CI: AOR, 10.661 (1.256, 90.494) more likely risk to develop pressure Ulcer than Participant who had no limitation in mobility. Patients who had Problem for friction and shear were 5 times (95% CI: AOR, 5.002(1.024, 24.445) more likely to develop pressure ulcer than Patient who had no apparent problem (table 7).

Those Patients who had DM not adhere to their medication were 2.4 times (95% CI: AOR, 2.357 (1.025, 5.423) more likely risk to develop pressure Ulcer than those adhere to their DM medication.

Participants who had not taken antimicrobial medications were 0.16 times (95% CI: AOR, 0.158 (0.026, 0.945) less likely to develop pressure Ulcer than patients with antimicrobial medications (table 8).

Note:- ** statistically significant association P<0.05.

Logistic Regression Method “BACKWARD LR” Was Used for Multivariate Analysis.

Discussion

The prevalence of pressure ulcer in this study was 15.7% which slightly exceeded than studies done in USA 5.4%, Republic of Ireland 9%, one university hospital and 11 general Hospital in China 1.58%, and University of Malaya, Malaysia; were 15.5 [19,20,14,21]. This gap might be Advancement in Technology which paves way to use different Pressure Reducing Overlays and Awareness level of Patient and availability of Pressure

Table 5: Distribution Pressure Ulcer with Patients and services related Variables in Public Hospitals in Sidama Zone, SNNPR, Ethiopia, 2017 (N=356).

Variables		Patients develop pressure Ulcer				
		NO		Yes		
		No	Percent (%)	No	Percent (%)	
BMI	<18.5 kg/m ²	101	75.4%	33	24.6%	
	18.5-24.99 kg/m ²	140	87.5%	20	12.5%	
	25-29.99 Kg/m ²	59	95.2%	3	4.8%	
Edema	No	241	87.3%	35	12.7%	
	Yes	59	73.8%	21	26.2%	
Patient levels of consciousness	Unconscious	50	75.8%	16	24.2%	
	Conscious	250	86.2%	40	13.8%	
Patient diagnosis	Diabetes Mellitus	287	85.4%	49	14.6%	
		13	65%	7	35%	
	Sepsis	186	82.7%	39	17.3%	
		114	87%	17	13%	
	Respiratory Disease	282	84.4%	52	15.6%	
		18	81.8	4	18.2	
	Anemia	283	84%	54	16%	
		17	89.5%	2	10.5%	
	Hypertension	285	85.3%	49	14.7%	
		15	68.2%	7	31.8%	
	Heart Disease	293	84.2%	55	15.8%	
		7	87.5%	1	12.5%	
Stroke	297	84.6%	54	15.4%		
	3	60%	2	40%		
Fracture	290	85%	51	15%		
	10	66.7%	5	33.3		
Turning position	No	181	80.4%	44	19.6%	
	Yes	119	90.8%	12	9.2%	
Length of Hospital stay	<6 days	46	97.9%	1	2.1%	
	>= 6 days	254	82.2%	55	17.8%	
Wards	Medical Surgical Gyn ICU	87	77%	26	23%	
		118	87.4%	17	12.6%	
		91	94.8%	5	5.2%	
		4	33.3%	8	66.7%	
Medical device	No	43	93.5%	3	6.5%	
	Yes	257	82.9%	53	17.1%	
Drug Profile	Antimicrobial	No	106	77.9%	30	22.1%
		Yes	185	87.7%	26	12.3
	Antihypertensive	No	274	85.1%	48	14.9%
		Yes	17	68%	8	32%
	Analgesics	No	244	82.7%	51	17.3%
		Yes	47	90.4%	5	9.6%
	Antidepressant	No	290	84.3%	54	15.7%
		Yes	1	33.3%	2	66.7%
	Ant diabetics	No	287	85.7%	48	14.3%
		Yes	4	33.3	8	66.7%

Table 6: Frequency and percentage of Anatomical Location and stage of Pressure Ulcer in Public Hospitals in Sidama Zone, SNNPR, Ethiopia, 2017 (N=356).

Variable		Frequency	Percentage
Stages of Pressure Ulcer	Stage I	21	5.9%
	Stage II	26	7.3%
	Stage III	4	1.1%
	Stage IV	5	1.4%
Anatomical Location Pressure Ulcer	Sacral	20	5.6%
	Shoulder	16	4.5%
	Hand & Lips	7	2%
	Greater trochanter, Heel, Leg, Nose, ear, Neck, Elbow, Other area (Occipital)	13	3.6%

Table 7: Parameter estimates from Binary logistic regression predicting pressure ulcer in Public Hospitals Sidama Zone, SNNPR, Ethiopia, 2017 (N= 356).

Variables	Pressure develop Ulcer		Crude OR(95% CI)	P-Value	
	No	Yes			
Patients age	18-39 Age	188	24	1	
	40-69 Age	87	27	2.431(1.327,4.455)*	0.004
	70-89 age	25	5	1.567(0.548,4.477)	0.402
Patient Gender	Male	111	27	1.585(0.893,2.815)*	0.116
	Female	189	29	1	
Educational Status	no education	92	20	3.261 (0.720,14.773)*	0.125
	only read and write	49	3	0.918 (0.145, 5.817)	0.928
	1-8 grade	86	20	3.488 (0.769, 15.819)*	0.105
	9-12 grade	43	11	3.837 (0.793, 18.576)*	0.095
	12+ grade	30	2	1	
Patient Level of consciousness	Unconscious	50	16	2.000(1.039,3.848)*	0.038
	Conscious	250	40	1	
Length of Hospital stay	<6 days	46	1	1	-
	>=6 days	254	55	9.961(1.345,73.783)*	0.024
Position Change	No	181	44	2.411 (1.223,4.753)*	0.011
	Yes	119	12	1	
Patient Body mass index	<18.5kg/m ²	101	33	6.426(1.888,21.869)*	0.003
	18.5-24.99kg/m ²	140	20	2.810(0.804,9.816)*	0.106
	25-29.99kg/m ²	59	3	1	
diabetes mellitus	No	287	49	1	
	Yes	13	7	3.154(1.199,8.299)*	0.020
Sepsis	No	186	39	1	
	Yes	114	17	0.711(0.384,1.316)	0.278
Disease of Respiratory	No	282	52	1	
	Yes	18	4	1.205(0.392,3.705)	0.745
Anemia	No	283	54	1	-
	Yes	17	2	0.617(0.138,2.746)	0.526
Hypertension	No	285	49	1	-
	Yes	15	7	2.714 (1.053,6.997)*	0.039
Stroke	No	297	54	1	-
	Yes	3	2	3.667(0.599,22.462)*	0.160
Fracture	No	290	51	1	-
	Yes	10	5	2.843(0.933,8.662)*	0.066
Antimicrobial	No	106	30	2.014(1.131,3.586)*	0.017
	Yes	185	26	1	
Antihypertensive	No	274	48	1	
	Yes	17	8	2.686(1.098,6.571)*	0.030
Analgesics	No	244	51	1	
	Yes	47	5	0.509 (0.193, 1.343)*	0.172
Antidepressants	No	290	54	0.093 (0.008, 1.045)*	0.054
	Yes	1	2	1	

patient have edema	No	241	35	1		0.004
	Yes	59	21	2.451 (1.330, 4.517)*		
patient with medical devices	No	43	3	1		0.078
	Yes	257	53	2.956 (0.884, 9.885)*		
Sensory Perception	Completely limited	32	8	1.129(0.472,2.703)		0.785
	Very limited	33	5	0.684(0.246,1.904)		0.468
	Slightly limited	104	14	0.608(0.306,1.210)*		0.156
	No impairment	131	29	1		-
Moisture	constantly moist	0	2			0.001
	very moist	0	5			
	occasionally moist	47	22	4.386 (2.305,8.346)*		
	rarely moist	253	27	1		
Activity	Bedfast	90	29	23.522 (3.129, 176.828)*		0.002
	Chairfast	57	10	12.807(1.593,102.988)*		0.017
	walks occasionally	80	16	14.600(1.889,112.850)*		0.010
	walks frequently	73	1	1		-
Mobility	completely immobile	27	8	16.593 (1.974, 139.481)*		0.010
	very limited	71	19	14.986(1.946,115.385)*		0.009
	slightly limited	146	28	10.740(1.427, 80.823)*		0.021
	no limitation	56	1	1		-
Nutrition	very poor	60	16	2.667(0.317,22.402)		0.366
	probably inadequate	195	34	1.744(0.216,14.064)		0.602
	Adequate	35	5	1.429(0.149,13.678)		0.757
	Excellent	10	1	1		
friction and shear	Problem	130	38	8.915(2.083,38.163)*		0.003
	potential problem	109	16	4.477(0.996,20.125)*		0.051
	no apparent problem	61	2	1		-
Antidiabetic drugs	No	287	48	0.084 (0.024,0.289)*		0.001
	Yes	4	8	1		-

NB: * P < 0.

Table 8: Parameter estimates from Logistic regression model predicting pressure ulcer in Public Hospitals Sidama Zone, SNNPR, Ethiopia, 2017 (N= 356).

Variables		Pressure develop Ulcer		COR/95%CI	AOR (95% CI)	P-Value
		No	Yes			
Position Change	No	181	44	2.411(1.223,4.75*	4.346(1.646,11.47)	0.003**
	Yes	119	12	1	1	
BMI	<18.5kg/m ²	6	33	6.426(1.888,21.869)*	6.912(1.307,36.554)	0.023**
	18.5-24.99kg/m ²	234	20	2.810(0.804,9.81)	3.379(0.631,18.10)	0.155
	25-29.99kg/m ²	60	3	1	1	
Moisture	constantly moist	0	2		0.000	
	very moist	0	5		0.000	
	occasionally moist	47	22	4.386(2.305,8.34*	4.739(1.999,11.23)	0.001**
	rarely moist	253	27	1	1	
Activity	Bedfast	14	29	23.522(3.129,176.828)*	13.365(1.622, 110.138)	0.016**
	Chairfast	8	10	12.807(1.593,102.988)*	6.246(0.669, 58.363)	0.108
	walks occasionally	81	16	14.600(1.889,112.850)*	5.175(0.599, 44.701)	0.135
	walks frequently	197	1	1	1	-
Mobility	completely immobile	2	8	16.593 (1.974, 139.481)*	5.708(0.539, 60.482)	0.148
	very limited	9	18	14.986(1.946,115.385)*	10.661(1.256, 90.494)	0.030**
	slightly limited	93	28	10.740(1.427,80.823)*	7.804(0.945, 64.464)	0.056
	no limitation	196	2	1	1	
friction and shear	Problem	130	38	8.915(2.083,38.1*	5.002(1.024,24.44)	0.047**
	potential problem	109	16	4.477(0.996,20.1)*	3.322(0.639,17.27)	0.154
	no apparent problem	61	2	1	1	-
Antidiabetic drugs	No	287	48	0.084(0.024,0.28)	2.357(1.025, 5.423)	0.044**
	Yes	4	8	1	1	
Antimicrobial	No	106	30	2.014(1.131,3.586)*	0.158(0.026, 0.945)	0.043**
	Yes	185	26	1	1	

preventive Devices, Policies toward Pressure Ulcer and length of Hospital stay.

The Prevalence was lower than studies done in Brazil 16.9%, different hospitals in Norway 24 %, Nigeria 18.6%, and Ethiopia 16.8% [26,25,22,23]. This gap might be due to Level of Hospitals, Patients condition.

The Overall prevalence of pressure Ulcer was 15.7 from which medical device related pressure Ulcer accounts 1.7%. Which was Lower than study Conducted in USA 34.5% and Saudi Arabia 39.3% [19,29]. This phenomenon can be interpreted with several reasons Variation in study institution, Patients conditions and Numbers of study Participants.

In this study, Age of the patient was associated with the occurrence of pressure ulcer. Although Age was predictor factor for pressure ulcer in Logistic regressions, it was not significantly associated with the development of pressure ulcer in multiple logistic regressions; As patient age increased, the development of pressure ulcer also increased ($P=0.04$). This finding was in line with study conducted in Felegehiwot Referral Hospital, Debere Markos Referral Hospital ($p<0.048$) Ethiopia [23,33] and study hospitals in Saudi Arabia ($P = 0.011$) [23]. But not supported in Quantitative sectional study conducted in Brazil ($p = 0.330$) [2].

In this study Braden pressure ulcer risk assessment tool (moisture, activity, mobility, and Friction and shear) was associated with the development of pressure ulcer from which.

Patients skin with occasionally moist and bed fast in activity significantly associated with pressure ulcer ($P=0.001$) and ($P=0.016$) it was similar reports with study conducted Republic of Ireland ($p < 0.0001$) and study conducted in Debere Markos Referral Hospital ($p=0.000$) [20,34]. the explanation might be when skin exposed to moisture; macerates and weakens the skin and start to break and Pressure ulcer can occur. patient stayed in bed to long time Pressure were created between patient skin and Interface; this will impair microcirculation and delayed oxygen and nutrients to the skin and tissue Ischemia were resulted and if prompt intervention not taken tissue become necrotize this were lead to pressure ulcer; Meanwhile accumulation of metabolic byproduct deteriorate conditions.

In this study, patient with very limited body mobility and problem on friction and shear were significantly associated $P=0.030$, and $P=0.047$ with pressure ulcer development, respectively. Similar report conducts in Republic of Ireland $P < 0.0001$ and study conducted in Bahir Dar Ethiopia [20,23]. This phenomenon can be interpreted with several reasons patient who have problem in maintain position might slide down to the bottom of the bed or wheelchair. Patient Skin and support surface move across one another; the outer layers of the skin remain stable while deep fascia moves with the skeleton, creating problem in the blood vessels and lymphatic system this might end up with pressure ulcer.

In this study Braden score statistically significant association $P=0.03$ between having a pressure ulcer and being at risk using Braden (cut-off 17) similar report conducted China and Debere markos Referral Hospital, Ethiopia [14]

In this study Patient who had no schedule for position

change significantly associated ($P=0.003$) with Pressure ulcer development. Similar report study conducted in adult intensive care unit Saudi Arabian ($P = 0.005$), Wolaita Sodo teaching hospital ($P<0.05$), but result of Felegehiwot referral hospital, Ethiopia; position change was not significantly associated with Pressure Ulcer [24,23]. The possible reason might be Patient were not position every two hours pressure between patient skin and interface were increase, low Nurse to Patient Ratio, Patient disease condition.

Diabetes Patient who were not adhere with Ant diabetic drugs two times more likely develop pressure ulcer than those with Ant diabetics drugs, which were significantly associated ($P=0.044$) with the Pressure ulcer. But Similar study long-stay institutions for the elderly in Sao Paulo, Brazil the result depicted that there was no significant correlation between use or nonuse of medications and the development of pressure ulcers. [27] The Possible reason might be Lack of information about the disease process, knowledge Gaps on diabetic medication Effect, Disease condition.

Patient who were not taken antimicrobial medication one times less likely develop pressure ulcer than those patients who were adhere with antimicrobial medication, which were significantly associated ($P=0.043$) with the Pressure ulcer. Similar study in Sao Paulo, Brazil there was no significant correlation between use or nonuse of medications and the development of pressure ulcers.[27] Reason might be antimicrobial medication were minimize burden of commensal microorganism, which were important for production Vitamins, and Maintain skin Integrity.

In this study Patients with body Mass Index $< 18.5\text{kg/m}^2$ six times more likely Develop pressure ulcer than Patient BMI 25-29.99 kg/m^2 ; which were significantly associated ($P=0.023$). Similar study which were conducted in USA ($P<0.0001$); but result of hospital in São Paulo, Brazil was not significantly associated with Pressure Ulcer ($P>0.05$) [30,31]. The reason might be Patients who had BMI $< 18.5\text{kg/m}^2$ had Exposed bony prominent which increased risk for pressure Ulcer.

Conclusion and Recommendation

This study found that the mean prevalence of pressure ulcers in Public hospitals in Sidama Zone is 15.7%; from which Medical Device related pressure ulcer which accounts 1.7%. Based on EPUAP grading scale; 5.9%, 7.3 %, 1.1%, and 1.4% patients developed stage I, stage II, stage III, and stage IV pressure ulcer, respectively. Position change: BMI, Activity, mobility, moisture, Antimicrobial, and ant diabetic were significantly associated with the development of pressure ulcer.

Each Public Hospitals

Risk assessments should be conducted as soon as possible after admission with (Braden Scale) and Conduct a comprehensive assessment for all patients (Clinical history, Pressure injury risk scale, Skin assessment, Mobility, and activity assessment)

Provision of training for Nurses on positioning and transferring patients based Manual handling techniques.

Recommendation to Health care Providers

Hospitalized patient should position every two hours intervals; if health conditions of patients permit.

Declarations

Ethics approval and consent to participate

The research proposal was approved by institutional review board of Jimma University, institute of health. An official letter of cooperation was given to Hawassa Comprehensive specialized hospital, Adare General Hospital, Yirgalem General Hospital, Leku. Participant was interview and Examine alone to keep the privacy. Respondents who are not wasting to be involved in the study and those who want to stop interview at any time could do so. The instruments were translated from English into Amharic language, reviewed by a group of researchers for meaning, clarity and cultural appropriateness, and backtranslated into English for verification.

Consent for publication

The purpose of the study was explained to the study participants at the time of data collection and verbal consent was secured from each participant before the start of data collection. Confidentiality was ensured by not including names or other identifiers in the data collection tool. The right of the participants to refuse participation or not to answer any of the questions was respected.

Authors' contribution

Yosef Yohanes conceived and designed the protocol. Yosef Yohanes, Gugsu Neme and Wadu Wolancho contributed on data analysis, and checked the draft. Yosef Yohanes and Abiru Neme prepared manuscript. All authors read and approved the final paper.

Conflict of Interest

All authors declared that they have no conflict of interests. Jimma University covered only the survey cost for this study and there is not any funding organization.

Availability of data and materials

All the data included in the manuscript has been included in the form of tables and figures. The de-identified raw data is not publicly available. But the de-identified raw data can be requested from the corresponding author after providing the necessary justification for request.

Funding

The study was funded by Jimma University throughout inception, data collection and analysis.

References

1. European Pressure Ulcer Advisory Panel & National Pressure Ulcer Advisory Panel, International Guideline Treatment of Pressure Ulcers: Quick Reference Guide. 2009;1-72.
2. Barbosa SG. Prevalence and Risk Factors for Pressure Ulcer in Hospitalized Adults. BMC res notes. 2018;11:847.
3. Sari A. Rate of Pressure Ulcers in Intensive Units and General Wards of Iranian Hospitals and Methods for Their Detection. Iran J Public Health. 2014;43(6):787-792.
4. Awwal LM. Pressure Ulcer Stages among Bed-Ridden Patients in Ahmadu Bello University Teaching Hospital

- (ABUTH), Zaria- Nigeria. J Nur Heal Sci. 2014;3(1):61-68.
5. Montalcini A. Nutritional parameters predicting pressure ulcers and short-term mortality in patients with minimal conscious state because of traumatic and non-traumatic acquired brain injury. Transl Med. 2015;13(1):305.
6. Benoit RA. Risk factors for pressure ulcer development in critically ill patients. Nursing Science. 2013; 33(6):57-66.
7. Bredesen IM. The prevalence, prevention, and multilevel variance of pressure ulcers in Norwegian hospitals: A cross-sectional study. Int J Nurs Stud. 2015;52(1):149-156.
8. Cooper KL. Evidence-Based Prevention of Pressure Ulcers in the Intensive Care Unit. Amer Ass Crit Care Nur. 2013;33(6):57-66.
9. Al-Shadedi AM. "Prevalence of Pressure Ulcers in Orthopaedic Patients" the Iraqi postgraduate medical journal. 2012;11(4):529-535.
10. Gilder CV, Amlung S, Harrison P et al. International Pressure Ulcer Prevalence Survey and a 3-Year, Acute Care, Unit-Specific Analysis". Ostomy Wound Mag. 2009;55(11):39-45.
11. Amir Q, Tanveer P, Melissa S et al. Clinical Guidelines Committee of the American College of Physicians "Risk Assessment and Prevention of Pressure Ulcers: A Clinical Practice Guideline from the American College of Physicians". Ann Intern Med. 2015;162(5):359-369.
12. Australian Wound Management Association, Pan Pacific Clinical Practice Guideline for the Prevention and Management of Pressure Injury. Australian Wound Management Association. 2012.
13. Callaghan R, Wound Care Today Pressure Ulcer Prevention using Strikethrough Resistant Technology™. Wound Care Today supplement. 2013;5.
14. Jiang O. The incidence, risk factors and characteristics of pressure ulcers in hospitalized patients in China. Int J Clin Exp Pathol. 2014;7(5):2587-94.
15. Lenka S, Katarina Z. "Validity of Pressure Ulcer Risk Assessment Scales: Review". Cent Eur J Nur Midw. 2014;5(2):85-92.
16. Mwebaza I. Nurses' Knowledge, Practices, and Barriers in Care of Patients with Pressure Ulcers in a Ugandan Teaching Hospital. Nur Res Prac. 2014;6.
17. EPUAP The 2014 International Stop Pressure Ulcer Day. Bri J Nur. 2014;23(20):9.
18. Black JM "Medical device related pressure ulcers in hospitalised patients". Int Wound J. 2010;7:358-65.
19. Moore Z, Cowman S. "Pressure ulcer prevalence and prevention practices in care of the older person in the Republic of Ireland". J Clin Nur, 2016;19(2):103-14.
20. Khor HM. Determinants of mortality among older adults with pressure ulcers. Arch Gerontol Geriatr. 2014;59(3):536-41.
21. Adegoke BA. Pressure ulcer prevalence among hospitalised

- adults in university hospitals in South-west Nigeria. *BMC Nursing*. 2013;21(3):128-34.
22. Haileyesus G. "Prevalence and Associated Factors of Pressure Ulcer among Hospitalized Patients at Felegehiwot Referral Hospital, Bahir Dar, Ethiopia". *Hindawi Pub Co Adv Nurs*. 2014;8(4):767-74.
23. Melese M K . "Prevalence and Associated Factors of Pressure Ulcer among Adult Inpatients in Wolaita Sodo University Teaching Hospital, South Ethiopia". *J Bio Agr Health care*. 2016;6(11):2224-3208.
24. Johansen E, Linda NB, Zena M. "Pressure Ulcer in Norway-A Snapshot of Pressure Ulcer Occurrence across Various Care Sites and Recommendations for Improved Preventive Care". *Healthcare*. 2015;3(2):417-28.
25. Brito PA. "Prevalence of pressure ulcers in hospitals in Brazil and association with nutritional status-A multicenter, cross-sectional study". *Nutrition*. 2013;29:646-49.
26. Chacon JMF, Blanes L, Hochman B. Prevalence of pressure ulcers among the elderly living in long-stay institutions in São Paulo. *Sao Paulo Med J*. 2009;127(4):211-5.
27. The Joint Commission, Division of Health Care Improvement" Preventing pressure injuries" quick Safety Issue 25. 2016;2.
28. Tayyib N. "Saudi Arabian adult intensive care unit pressure ulcer incidence and risk factors: a prospective cohort study". *Int Wound J*. 2016;13:912-19.
29. Gardliner JC. Incidence of hospital-acquired pressure ulcers – a population-based cohort study. *Int Wound J*. 2016;13(5):809-20.
30. Scarlatti KC, Michel JLM, Gambá MA et al. Pressure ulcers in surgery patients: incidence and associated factors. *Rev Esc Enferm USP*. 2011;45(6):1369-75.
31. Baumgarten G. Extrinsic Risk Factors for Pressure Ulcers Early in the Hospital Stay: A Nested Case-Control Study. *J Gerontology: Med sci*. 2008;63(4):408-13.
32. Barbara JB, Maklebust J. Preventing Pressure Ulcers with the Braden Scale. *AJN*. 2005;105(6):70-2.
33. Vanderwee K, Clark M, Dealey C et al. Pressure ulcer prevalence in Europe: a pilot study. *J Eval Clin Pract*. 2007;13(2):227-35.
34. Bergstrom N, Demuth PJ, Braden BJ. A clinical trial of the Braden Scale for Predicting Pressure Sore Risk. *Nurs Clin North Am*. 1987;22(2):417-28.

***Correspondence to:**

Abiru Neme
Negewo, Jimma University
Institute of Health, School of Nursing
Ethiopia
Tel: 0965240864
E-mail: abiruneme@gmail.com