

**PREVALENCE AND ASSOCIATED FACTORS OF PRESSUE ULCER
AMONG ADULT INPATIENTS IN WOLAITA SODO UNIVERSITY
TEACHING HOSPITAL, SOUTHERN ETHIOPIA.**

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JIMMA, ETHIOPIA

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Abstract

Background: The prevalence of pressure ulcers can range anywhere from 0% to over 38% depending on the sector, from general or University Hospitals to home care to nursing homes..

Objective: To assess prevalence and associated factors of pressure ulcer among adult inpatients in Wolaitta Sodo University Teaching Hospital, Southern Ethiopia 2015.

Methods: Institution based cross-sectional study was employed in Wolaita Sodo University Teaching Hospital. The total sample size is 239 and participants were selected by using systematic sampling technique from each ward. Data were collected by face to face interview using a structured and pretested questionnaire. Data were entered into Epi Data version 3.1, edited and cleaned for inconsistencies and data were analyzed using SPSS version 16.0. Simple and multiple logistic regression analysis were performed to identify the final predictors of pressure ulcer development.

Results: A total of 32 pressure ulcers were detected in 239 patients, with the prevalence of 13.4%.The prevalence of pressure ulcer was higher in male respondents 17 than in female respondents 15. This is because of most of the respondents were males. The application of the multiple logistic regression technique showed that the presence of pressure ulcer were significantly associated with Diabetes (AOR=4.116;95%CI=2.135,6.884), absence of change of patientspositionbynurses(AOR=3.20;95%CI=1.34,6.23),bedriddenpatients(AOR=3.01;95%CI=1.30,4.456),Antidepressantusers(AOR=6.016;95%CI=1.420,6.652),durationofhospitalstay \geq 21days(AOR=4.67;95%CI=1.98,12.00),Verylimitedsensoryperception(AOR=2.773;95%CI=1.244,4.64) activitystatus(bedbound)(AOR=2.34;95%CI=3.24,4.13)andfrictionandshearproblems(AOR=2.2; 95%CI=1.85, 15.79).

Conclusion: The prevalence of pressure ulcer was high among hospitalized patients. Prolonged length of stay in hospital, problem of sensory perception, activity status, and general condition of the patients, patient's principal diagnosis, and medications in use, change of patient's position and friction and shearing forces were significantly associated with the presence of pressure ulcer

Recommendations: Nursing director should facilitate and strengthen the staffs to use pressure ulcer preventive devices. Nurses should practice change of patient's position every 2hours.

Key Words: Pressure ulcer, prevalence, adult inpatients, associated factors.

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List of Abbreviations and Acronomy

CHS	Collage of Health Sciences
ICU	Intensive Care Unit
JU	Jimma University
BSc.N	Bachelor of Science in Nursing
SPSS	Statistical Package for Social Sciences
NPUAP	National pressure ulcer advisory panel
EPUAP	European pressure ulcer advisory panel
mmHg	Millimeter mercury
UK	United Kingdom
ABUTH	Ahmadu Bello University Teaching Hospital
HAPU	Hospital Acquired pressure ulcer
WSUTH	Wolaitta Soddo University Teaching Hospital
SNNPRS	South nation nationalities and peoples regional state

CHAPTER ONE: INTRODUCTION

1.1 Background

Any lesion caused by excessive non uniform pressure resulting in damage of underlying tissue & skin. Pressure ulcers are areas of localized cellular damage to the skin and underlying tissues, caused by pressure, shearing, and frictional forces. They usually occur over bony prominences such as the sacrum, heels, and hips and are graded according to the amount of tissue damage (1).

A pressure ulcer can occur anywhere on the body where there is prolonged exposure to pressure. Prolonged pressure (from lying or sitting on a specific part of the body) will impede capillary blood supply to an area and thus limit the delivery of oxygen and nutrients to tissue, placing patients at risk for skin breakdown .Expected capillary pressure ranges are between 10 and 30 mmHg. Tissue hypo-perfusion occurs when the interface pressure exceeds capillary pressure thus increasing the likelihood of pressure ulcer development (2).

The usual mechanism of forming a decubitus ulcer is from pressure. It can occur from friction by rubbing against something such as a bed sheet, cast, brace, etc., or from prolonged exposure to cold. Any area of tissue that lies just over a bone is very likely to form a decubitus ulcer. These areas include the spine, coccyx or "tailbone," hips, heels, and elbows, to name a few. Prolonged pressure can be experienced internally, between bony prominences and soft tissue, which results in ischemia and necrosis. This tissue then begins to decay from lack of blood circulation. A number of Contributing or confounding factors are also associated with pressure ulcers; the significance of these factors is yet to be elucidated (clarifying something) (3, 4, 5).

The risk factors for the development pressure ulcers have been grouped by several writers as intrinsic (such as: aging ,skin temperature, patients with cerebrovascular disease, Parkinson's disease, advanced dementia, contractures, and most commonly orthopedics injuries, conditions that restrict mobility, such as diabetic neuropathy and spinal cord injuries) and extrinsic factors (such as pressure, friction, shearing, and moisture) (6).

Pressure ulcer stages: are distinct phases or periods in the course of a localized damage to the skin and underlying tissue. Stage I: Intact skin with non-blanchable redness of a localized area usually over a bony prominence. Darkly pigmented skin may not have visible blanching (to lose color); its color may differ from the surrounding area. Stage II: Partial thickness loss of dermis presenting as a shallow open ulcer with a red pink wound bed, without slough (deep muddy hole wound). This may also present as an intact or open/ruptured serum-filled blister. Stage III: Full thickness tissue loss, subcutaneous fat may be visible but bone, tendon or muscle are not exposed. Slough may be present but does not obscure the depth of tissue loss. Stage IV: Full thickness tissue loss with exposed bone, tendon or muscle. Slough or eschar may be present on some parts of the wound bed. Often include undermining and tunneling. Unstageable: Full thickness tissue loss in which the base of the ulcer is covered by slough (yellow, tan, gray, green or brown) and/or eschar (tan, brown or black) in the wound bed (7).

Today, much advancements at preventing Pressure ulcers has been documented in the developed nations with the advent of sophisticated equipments such as alternating pressure mattresses/overlays, air fluid beds, low-air-loss beds and devices such as water-filled mattresses, air filled mattresses and gel-filled mattresses/overlays among others(8,9).

1.2 Statement of the Problem

Pressure ulcers and the risk factors associated with their development have been studied for almost 50 years yet the temporal, pressure ulcer risk factors and pressure ulcer prevalence is still poorly understood (10).

Pressure ulcer significantly threatens the well-being of patients with limited mobility and is used as a quality indicator of nursing care in many institutions around the world (11).

Hospital acquired pressure ulcer (HAPU) rates increased by 63% between 1993 and 2006 .These statistics have not been risk-adjusted for severity of illness; however, hospital admission rates increased only 11% during the same period, and hospital stays for patients over 65 years old increased by 14%, suggesting that the observed increase in HAPU rates are not entirely a function of the patient demographic. This increase in HAPUs contributes to higher health care costs, increased morbidity and mortality rates (12).

Patients admitted to hospital or otherwise confined to bed, chair, or wheelchair are at risk for the development of pressure ulcers. Pressure ulcers pose a major burden for health care in western countries. In the Netherlands more than 1% of the total budget for health care is spent on prevention and treatment of pressure ulcers or prolonged hospital stay once a pressure ulcer develops (13).

The treatment of patient with PU is a major concern & an important wound healing challenge to health care providers working in many health care settings. In addition, PU is associated with high morbidity & mortality; especially in frail elderly people with 50% develop severe pressure damage dying within 4 months (14).

Patients confined to bed for long periods, patients with motor or sensory dysfunction & patients who experiences muscular atrophy are prone to PU.The people most commonly affected by PU are aged people, immobile with impaired sensory perception, decreased tissue perfusion, deceased nutritional status .The extra costs associated with decubitus in Dutch health care institutions are estimated to be approximately 450 million Euros a year, due to lengthened hospitalization periods and expensive preventive materials. These figures clearly indicate that pressure ulcers are a major problem in health care's (15).

Episodes of Pressure ulcers are common phenomenon in the Nigerian clinic settings with Ahmadu Bello University Teaching Hospital (ABUTH) inclusive although, there is a dearth of empirical data on their the various stages of the ulcers suffered by patients in Nigeria .Once pressure ulcer is developed, it can provide wound healing process by change of dressing, continued wound assessment, and proper nutrition. High protein diet was indicated because high amount of protein is lost through the wound. However the cost of treatment has been estimated as 2.5 times that of prevention; implementing a pressure ulcer prevention program remains essential. When the stage of pressure ulcer increases, the cost of treatment also increases; as a result, stage IV of pressure ulcer requires high cost. There was no study conducted in study area on prevalence and associated factors of pressure ulcer. So the purpose of this study was to assess the prevalence and associated factors of pressure ulcer among adult inpatients in Wolaita Sodo university teaching hospital (16).

CHAPTER TWO: LITERATURE REVIEW

2.1 Prevalence of pressure ulcer

The prevalence of pressure ulcers can range anywhere from 0% to over 38% depending on the sector, from general or university hospitals to home care to nursing homes. Among intensive care unit (ICU) patients, prevalence has been reported to be roughly 14% in short-stay units (average length of stay 4.5 days) and 42% in long-stay units (average length of stay 12.8 days) (17).

The most recent International Pressure Ulcer Prevalence Survey substantiates the disproportionate prevalence of pressure ulcers in ICUs. Pressure ulcers acquired in the ICU had a prevalence rate of 8.8% to 12.1% in 2008 and 2009, respectively representing approximately 8,000 to 11,000 patients annually who developed a pressure ulcer while in the ICU in the US. In 2009, 3.3% of US ICU patients developed a severe facility-acquired pressure ulcer defined as Stage III, Stage IV, Unstageable, or deep tissue injury. These findings suggest that clinicians working in ICUs need prevention strategies focused on risk factors specific to their patient population (18).

In the United States, a national study on pressure ulcer prevalence carried out in 1999 assessed 42,817 hospitalized patients, with the following distribution per clinic: medical (28%), surgical (13%), semi-intensive (9%), orthopedic (7%) and intensive care (7%). The global prevalence of patients with pressure ulcer in that study was 14.8%, with the highest level among intensive care patients (21.5%) (19).

A few epidemiological studies in Brazil have assessed the prevalence of pressure ulcers in long-term care facilities and one hospital. These studies reported a prevalence of 25.6% among patients in intensive care units (ICUs) and a prevalence of 10.95% among the elderly population living in long-stay institutions (20).

At Shands Hospital UF, of the hospital acquired pressure ulcers documented from January 2005 through September 2006, the majority occurred in ICU patients. According to the Agency for Healthcare Research and Quality (AHRQ), the number of hospital patients who develop pressure sores has increased by 63% since 1996 (21).

From the literature reviewed, prevalence rates vary among different countries and different clinical settings. For the purpose of this discussion, prevalence data from long-term care settings have been selected and 8% were reported in similar long-term health care facilities in Canada reported a prevalence of 9% in non acute settings (22).

In long-term care, prevalence was reported at 2% and 8% in the Netherlands and Germany, respectively. In Italy, prevalence across 10 long-term units was reported at 27% (23).

According to Theillman the prevalence of high-grade decubitus ulcers (grades 3 and 4) is as high as 3%, and may reach 4% among elderly persons receiving nursing care in health institutions. There has been no significant decline in the prevalence of decubitus ulcers over the last 10 years, as a study from Hamburg has shown (24).

Although 70% of ulcers occur in persons older than 65 years; the statistics show that 70% of pressure ulcers occur in individuals over the age of 70 years old (25).

In 2009, facility acquired prevalence rates for critical care units ranged from 8.8 % in cardiac care to 10.3 % in surgical intensive care units. Prevalence rates in various types of intensive care units were in the range of 15–20 %. These results illustrate that significant opportunities exist for improving pressure ulcer preventive practices in critical care. Prevalence survey, prevalence rates in 2009 on various acute care medical and surgical units were in the 8–14 % range with the facility acquired rate in the range of 3-5% (26).

Study conducted in the Jordan showed those pressure ulcers are a significant health problem among hospitalized patients with a prevalence of 12% or 7% when grade I was excluded. Another studies in Europe, South America, Canada and South Africa show that anywhere between 5% and over 40% of all hospitalized patients in major series suffer from pressure ulcerations at some point during their hospital stay . According to the study conducted in Felege hiwot referral hospital in Bahir Dar March 25, 2013, Ethiopia, the prevalence of pressure ulcer was 16.8 % (27-29).

2.2 Risk factors of pressure ulcer

The literature abounds with lists of risk factors associated with pressure-ulcer development. However, any disease process that renders an elderly person immobile for an extended period of time will increase the risk for pressure-ulcer development. There are intrinsic factors and extrinsic factors that determine the tolerance of soft tissue to the adverse effects of pressure.

Intrinsic risk factors are physiologic factors or disease states that increase the risk for pressure-ulcer development (e.g. age, nutritional status, and decreased arteriolar blood pressure (30).

Extrinsic factors are external factors that damage the skin (e.g. friction and shear, moisture, and urinary or fecal incontinence, or both). Variables that appear to be predictors of pressure-ulcer development include age 70 years, impaired mobility, current smoking history, low body mass index, altered mental status (e.g. confusion), urinary and fecal incontinence, malnutrition, restraints, malignancy, diabetes mellitus, stroke, pneumonia, congestive heart failure, fever, sepsis, hypotension, renal failure, dry and scaly skin, history of pressure ulcers, anemia, lymphopenia, and Hypoalbuminemia (31).

The growing body of medical evidence on pressure ulcer risk factors indicates that some risk factors, such as advanced age and poor nutritional status, are common among various patient groups, while other risk factors may be unique or exhibit disproportionate importance within specific patient groups, such as the critically ill (32).

Furthermore, well known patient risk factors such as immobility, age, and nutritional status increased the probability of presenting with pressure ulcer. In a more recent work that included 672 patients in 3 Irish hospitals, the authors found reduced mobility and length of hospitalization as factors significantly associated with pressure ulcer (33).

Impaired nutritional status is considered an important risk factor in the outcome of hospitalized patients. Thus, it is noteworthy that in the current study, 98% of those who showed severity of pressure ulcer greater than or equal to stage II were malnourished, and 16.3% of the high-severity patients had more than three pressure ulcer (34).

The study conducted in Thailand showed that presence of pressure ulcer was significantly associated with the use of pressure ulcer preventive devices Pressure ulcer can be prevented through decreasing pressure, friction, and shear. In those patients at risk, the first preventive action is to reduce the effect of pressure, friction, and shear forces. The most commonly recommended method for reducing pressure is frequent turning and positioning (35).

The study conducted in Sweden (2013); Braden elements were significantly associated with the occurrence of pressure ulcer (36).

The study conducted in Turkey showed that, pressure ulcer and their severity were directly associated with malnutrition. Patients who are bedridden, who are elderly, who have neurological disorders or cancer, who are staying at a public or private institution, and who are staying at the hospital between 8 days and 22days had an increased risk of pressure ulcer(37).

The present study conducted in Brazil investigated that the problem of friction and shearing was statistically significant and strongly associated with pressure ulcer development (38).

A study conducted in Thailand, which revealed that occurrence of pressure ulcer was associated with the completely limited activity and presence of moisture (39).

The study conducted in Taiwan, which revealed that occurrence of pressure ulcer was associated with the change of patient's position by nurses. Results from healthy subject studies demonstrated that increasing the head of bed increased the interface pressures and the areas subjected to interface pressures of 32 mm Hg or greater. Additionally, lateral turning was not adequate in unloading areas at risk for pressure ulcer formation and these areas always remained at risk despite repositioning (40).

Solutions to reduce pressure ulcer incidences involve through a number of methods: improved turning protocols, better support devices for lateral turning, providing feedback to caregivers, and continuous interface pressure monitoring. An alternative to pressure relieving or reducing devices, is manual turning or repositioning of patients. Reducing and redistributing interface pressures is one of the most common pressure ulcer prevention methods and is considered a standard of pressure ulcer prevention ways. A study conducted in Nigeria showed that immobile, bedridden patients were dependent on caregivers for both repositioning and transfers, increasing the risk for exposure to the forces of friction/shear and subsequent development of pressure ulcers (41).

The investigation done in German revealed that about 57% of patients who developed pressure ulcers had endocrine disease. Although endocrine disease has been associated with the development of pressure ulcers in admitted patients, this co morbid condition has not been studied extensively as risk factors for pressure ulcer development. Further researches needed to elucidate the importance of this unmodifiable risk factor in the development of pressure ulcers in general critical care Patients (42).

Of note, 32 of the 65 patients (49%) in study conducted in Greek who had a pressure ulcer develop received antidepressants. Moreover, the mean number of hours of antidepressant intake in patients who had stage II or higher pressure ulcers was significantly higher than in patients who remained ulcer-free. Evidence to support antidepressant as a predictor of pressure ulcers in critical care patients is increasing (43).

2.3 Conceptual framework

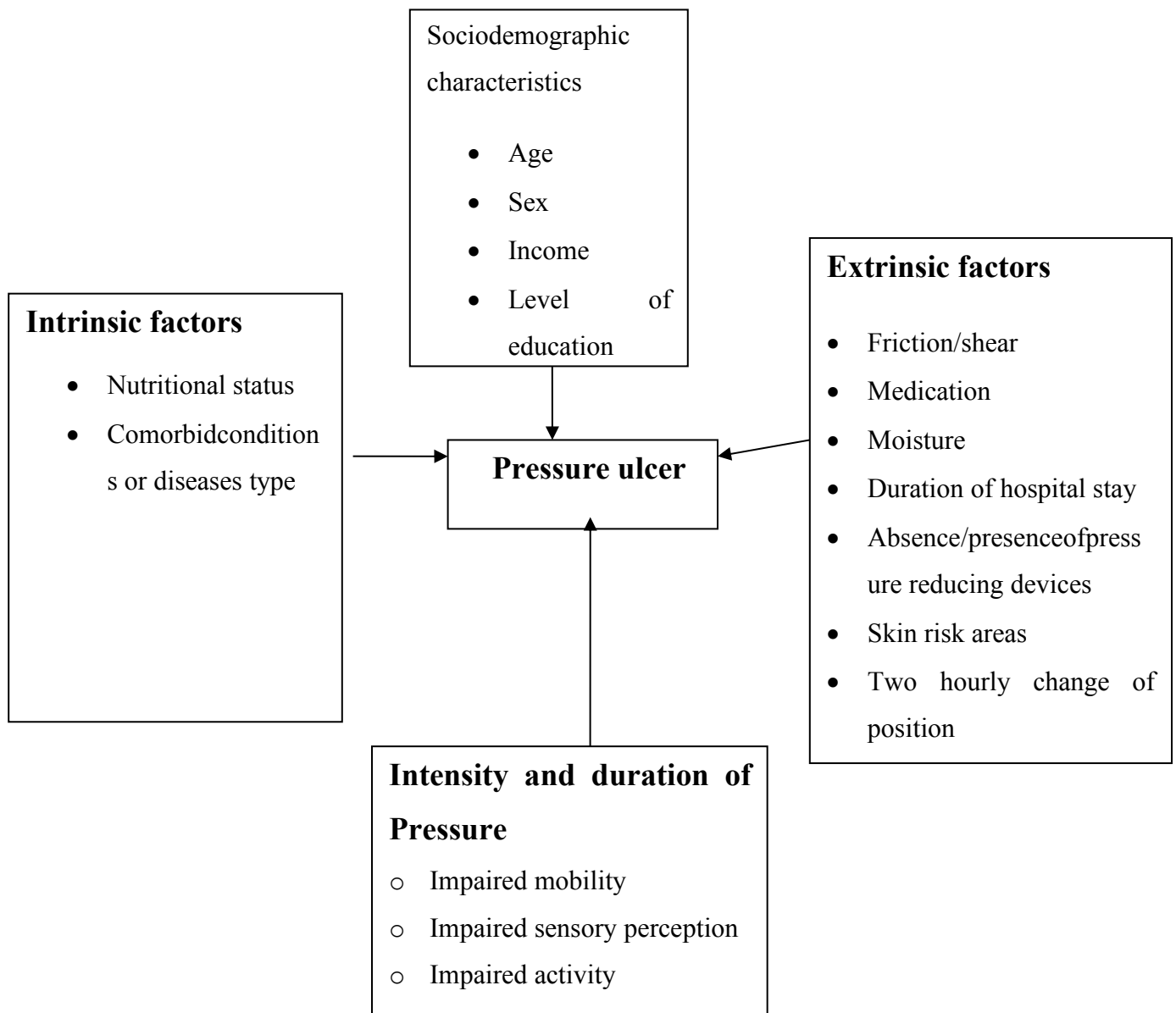


Figure 1 conceptual frame work for associated factors of pressure ulcer: Developed by investigator after reviewing various literatures.

2.4 Significance of the study

This study will provide nurses and the management of Wolaitta Soddo University Teaching Hospital (WSUTH), with the necessary awareness about the prevalence and associated factors of pressure ulcer among adult inpatients as well as the pressure relieving devices care given by the care providers. Based on this study finding, the management of WSUTH will be able to reestablish the importance of improving pressure ulcer risk assessment and prevention through the implementation of guideline recommendations and prevention protocols of pressure ulcer as an addition to the basic health care practice that is commonly provided for adult inpatients and others at risk for pressure ulcer development.

This study will help nurses to recognize or understand the prevalence and associated factors of pressure ulcer among adult inpatients in the area. This will provides them to use different preventive mechanisms of pressure ulcer and identifying specific associated risk factors of pressure ulcer development. Early reorganization of risk factors of pressure ulcer development is useful for patients to minimize health care costs of pressure ulcer treatments. In addition to this, is essential to them to prevent pressure ulcer associated morbidity and mortality. The study might be used as a literature review for feature researchers concerning prevalence and associated factors of pressure ulcer.

CHAPTER THREE: OBJECTIVES

3.1 General objectives

- To assess prevalence and associated factors of pressure ulcer among adult inpatients in Wolaita Sodo University Teaching Hospital, Southern Ethiopia.

3.2 Specific objectives

- To determine the prevalence of pressure ulcer among adult inpatients in Wolaita Sodo University Teaching Hospital.
- To identify associated factors of pressure ulcer among adult inpatients in Wolaita Sodo University Teaching Hospital.

CHAPTER FOUR: METHODS AND MATERIALS

4.1. Study area and period

The study was conducted from March 1/ 2015 to April 30/ 2015 in Wolaita Sodo University Teaching Hospital. Wolaita Sodo University Teaching Hospital (WSUTH) is found in South Nations Nationalities and People Region States (SNNPRS), Ethiopia. The Teaching Hospital is located in Sodo town of Wolaita Zone, SNNPRS which is 380 km away from the national capital Addis Ababa and 170 km far from the regional capital Hawassa. The teaching hospital was established in 1928 and serving people in catchment area of 2 million people including neighboring Dawuro Zone, Gamo Gofa Zone and Kambata Tambaro Zone. It has the total capacity of about 195 inpatient beds.

According to the data obtained from the hospital approximately 48036 people visits outpatient department per year and 5998 people admits inpatient department per year. The hospital has different wards. Among these wards medical wards, surgical wards, and ICU wards have total patient flow per year was 1836, 1452 and 348 respectively (WSUTH Annual report, 2014).

4.2 Study Design

Institution based cross sectional study was employed.

4.3 Population

4.3.1 Source population

All adult patients who were admitted in medical, surgical and ICU of Wolaita Sodo University Teaching Hospital from March 1to April 30/ 2015

4.3.2 Study population

All sampled adult patients who were admitted in the study wards at the time of data collection.

4.3.3 Inclusion Criteria:

- Admitted to one of selected wards during the course of the study.
- All admitted patients who were stayed in selected wards greater than or equal to 24 hours was included in the study.
- Patients who developed pressure ulcer before admission in study area.

4.3.4 Exclusion criteria

- Exclude from the study was children (age less than 18 years).
- All admitted patients who stayed in selected wards less than 24 hours were excluded in this study.

4.4.1 Sample size determination

The hospital has different wards. Among these wards medical wards, surgical wards, and ICU wards are important to this research with the total patient flow per year, 1452 surgical wards, 1836 medical wards, and 384 ICU wards .(WSUTH Annual report, 2014).

The sample size was determined using a formula for estimation of single population proportion

with the following assumptions: prevalence (p) of pressure ulcer 16.8%, Z = standard normal

distribution value at 95% confidence level of $Z_{\alpha/2} = 1.96$ and margin of error (d) = 4%.

$$n = \frac{(Z \frac{\alpha}{2})^2 P (1 - p)}{d^2}$$

$$= 336.$$

Since source population (612) < 10,000. Then the required sample size was calculated by using population correction formula

$$nf = \frac{n}{1 + \frac{n}{N}}$$

$$nf = \frac{336}{1 + \frac{336}{612}} = 217$$

Adding 10% for non- response ($10 \times 217 / 100 = 22$), the total sample size (217+22) was 239 patients. The sample size was allocated for each ward proportionally to the sample size (95 from surgical wards, 121 from medical wards and 23 patients from ICU wards).

4.4.2 Sampling Technique

Systematic sampling technique was used to select samples from each ward.

4.5 Study Variables

4.5.1 Dependent variable

Pressure ulcer

4.5.2 Independent variables

- Age
- Sex
- Income
- Level of education
- Sensory perception
- Moisture
- Activity
- Mobility
- Nutrition status
- Friction/shear
- Medications
- Co morbid conditions
- Location of pressure ulcer
- Stages of pressure ulcer
- Two hourly changes of patient's position
- General condition of the patients
- Presence or absence of pressure reducing devices

4.6. Data collection procedure

4.6.1 Data Collection Instrument

Data were collected by face to face interview using a structured and pretested questionnaires and physical examination (observation). The questionnaire has three parts. Part A₁ is a structured questionnaire that contains socio-demographic data, part A₂ questionnaires that shows description of pressure ulcer. Part B is the tools used to assess the associated factors for pressure ulcer development.

4.6.2 Data Collection Personnel

A total of 4 BScNurses were recruited out of WSUTH, three for data collection and one for supervision. They were trained and oriented for one day on the questionnaire and the way of data collection.

4.7 Data quality assurance

Data collectors were supervised during the data collection period. The collected data were reviewed and checked for completeness, missed and jumped questions by the supervisors and principal investigator. The questionnaires were pre- tested in JUSH to assess clarity, sequence, consistency, understandability and for total time it takes before the actual data collection. Finally necessary comments and feedback were incorporated for the final instrument.

4.8 Operational definition and definition of terms

Pressure ulcer is localized injury to the skin and/or underlying tissue usually over a bony prominence. In this study pressure ulcer was measured using tools that ask stages of pressure ulcer, location of pressure ulcer, evidences of pressure ulcer and number of pressure ulcer were measured by using observational check list and physical examination by the yes or no questionnaires. Presence of laceration between skin and underlining tissue due to admission indicates pressure ulcer development. Absence of laceration between skin and underlining tissue or intact skin in admitted patients indicate absence of pressure ulcer development.

Bedridden confined to bed by weakness or old age or due to diseases or lying or sitting for long period of time.

Patient: client or person who is receiving professional medical help or treatment or person who is recipient of nursing care.

Tools used for assessment of associated factors for the development of pressure ulcer were measure through as follows.

Sensory Perception. Sensory perception measures the individual ability to feel and report discomfort.

1. Completely Limited. The patient is unresponsive (does not moan, flinch, or grasp) to painful stimuli, due to diminished level of consciousness or sedation or limited ability to feel pain over most of the body.

2. Very Limited. The patient responds only to painful stimuli, cannot communicate discomfort except by moaning or restlessness, or has a sensory impairment which limits the ability to feel pain or discomfort over 1/2 of body.

3. Slightly limited. The patient responds to verbal commands but cannot always communicate discomfort or the need to be turned or has some sensory.

4. No impairment. The patient responds to verbal commands and has no sensory deficit which would limit the ability to feel or voice pain or discomfort.

Moisture. Moisture measures the degree to which the skin is exposed to moisture.

1. Constantly moist. The skin is kept moist almost constantly by perspiration, urine, and so forth; dampness's detected every time the patient is moved or turned.

2. Very Moist .The skin is often but not always moist. Linen must be changed at least once a shift.

3. Occasionally moist. The skin is occasionally moist, requiring an extra linen change approximately once a day.

4. Rarely moist. The skin is usually dry; linen only requires changing at routine intervals.

Activity. This includes degree of physical activity.

1. Bedfast. The patient is confined to bed.
2. Chair fast. This includes severely limited ability to walk or nonexistent one. The patient cannot bear his/her own weight and or must be assisted into chair or wheelchair.
3. Walks occasionally. The patient walks occasionally during day, but for very short distances, with or without assistance and spends the majority of each shift in bed or chair
4. Walks frequently. The patient walks outside the room at least twice a day and inside the room at least once every 2 hours during waking hours.

Mobility. This includes the ability to change and control body position.

1. Completely immobile. The patient does not make even slight changes in his/her body or extremity position without assistance.
2. Very limited. The patient makes occasional slight changes in his/her body or extremity position but is unable to make frequent or significant changes independently.
3. Slightly limited. The patient makes frequent slight changes in his/her body or extremity position independently.
4. No limitation. The patient makes major and frequent changes in his/her position without assistance.

Nutrition. Nutrition reflects the food intake pattern of the assessed person, as well as liquid supplements.

1. Very Poor. The patient never eats a complete meal, rarely eats more than 1/3 of any food offered, eats 2servings or less of protein (meat or dairy products) per day, takes fluid poorly, does not take a liquid dietary supplement, or does not take any food by mouth and/or maintained on clear liquids or intravenous solutions for more than 5 days.

2. Probably Inadequate. The patient rarely eats a complete meal and generally eats only about 1/2 of any food offered. Protein intake includes only 3 servings of meat or dairy products per day. Occasionally the patient will take a dietary supplement or receives less than optimum amount of liquid diet or tube feeding.

3. Adequate. The patient eats over half of most meals, eats a total of 4 servings of protein (meat, dairy products) per day, occasionally will refuse a meal but will usually take a supplement when offered, or is on tube feeding.

Friction/shear. Friction and shear assess the person's ability to keep the skin free from contact with the wrinkle area.

1. Problem. The patient requires moderate to maximum assistance in moving. Complete lifting without sliding against sheets is impossible. The patient frequently slides down in bed or chair, requiring frequent repositioning with maximum assistance. Spasticity, contractures, or agitation leads to almost constant friction.

2. Potential problem. The patient moves feebly or requires minimum assistance. During a move skin probably slides to some extent against sheets, chair, restraints, or other devices. The patient maintains relatively good position in chair or bed most of time but occasionally slides down.

3. No apparent problem. The patient moves in bed and in chair independently and has sufficient muscle strength to lift up completely during move and maintains good position in bed or chair.

4.9 Data processing and analysis

Data were entered into Epi Data version 3.1. Data were processed and analyzed in Statistical Package for the Social Sciences (SPSS) - version 16.0. Odds ratios (AOR) and 95% confidence intervals (CI 95%) were calculated to test for associations between independent variables and the presence of pressure ulcer, using the multiple logistic regression technique. All explanatory variables which have association in simple logistic analysis with P-value less than 0.25 were entered into multiple logistic regression model in order to assess the independent associated factors of pressure ulcer among adult inpatients in WSUTH. P-value of less than 0.05 was taken as statistical significance. Results were summarized and presented by tables and charts.

4.10 Ethical Consideration

Ethical clearance and approval letter was obtained from JU CHS, Ethical Review Board to communicate with Wolaita Sodo University Teaching Hospital Administrative Body. Permission letter was obtained from Administrative Body of Wolaita Sodo University Teaching Hospital. The Matron-in-charge of Hospital was briefed on the purpose of the research and she /he permission sought. Finally verbal consent was obtained from the patients or from their family included in the study immediately before the distribution of questionnaire.

4.11 Dissemination plan

The final report will be disseminated to the Department of Nursing and Midwife, College of Health sciences, Jimma University. Again the study findings will be disseminated to the Wolaita Sodo University Teaching Hospital and other relevant bodies, after the completion of the academic process at Jimma University.

It will be published in journal for further utilization.

CHAPTER FIVE: RESULTS

5.1 Sociodemographic Characteristics

A total of 239 admitted patients in WSUT hospital were included in this study with the response rate of 100%. Overall, 144(60.3 %) come from rural and rest were urban residents and 109 (45.7 %) were protestants and 6(2.5 %) were Muslim.

Proportions of males were 127 and females were 112 the majority of the study participants were in the age range of 29-39 (34.37%) and the mean age of the respondents was 34years. Majority of the respondents 152(63.6 %) were married and 63(26.4%) participants were single. About 96 (40.2 %) of the respondents were not educated and 52(22.2 %) respondents were above secondary levels (Table 1).

Table 1. Distribution of the respondents by their Sociodemographic characteristics in WSUT Hospital, southern Ethiopia from March to April 2015 (n=239).

	Variables	Frequency	Percentage (%)
Age	18-28	80	33.47
	29-39	82	34.37
	40-49	57	23.8
	>50	20	8.36
Sex	Males	127	53.1
	Females	112	46.9
Marital status	Married	152	63.6
	Single	63	26.4
	Divorce	19	7.9
	Widowed	5	2.1
Ethnicity	Wolaitta	141	59
	Gurage	39	16.3
	Dawuro	25	10.5
	Amhara	24	10
	Tigray	10	4.2
Level of education	Illiterate	96	40.2
	Primary school	22	9.2
	Secondary school	68	28.5
	Above2ndry school	53	22.2
Religion	Protestant	109	45.7
	Orthodox	89	37.2
	Catholic	35	14.6
	Muslim	6	2.5
Occupational status	Farmer	76	31.8
	Merchant	64	26.8
	House wife	54	22.6
	Gov't employ	29	12.1
	Daily Labor	16	6.7
Residence	Rural	144	60.3
	Urban	95	39.7
Estimated income in Birr	≤1170	177	74.1
	>1170	62	25.9

5.2 Prevalence and Stages of Pressure Ulcer

A total of 32(13.4%) pressure ulcer were detected in 239 patients. The prevalence of pressure ulcer was higher in male respondents 17 than in female respondents 15. This could be because majority of the patients were males. Based on EPUAP grading scale; 14 (43.75 %) and 9(28.125%) patients developed stage II and stage III pressure ulcer respectively. Among ulcer developed patients, 3(9.375%) constituted advanced stage (stage IV) of pressure ulcer. Of those who developed pressure ulcer, most of the participants 18(56.25%) and 12(37.5%) developed at buttock and sacral area respectively. 1 (3.125 %) patients developed pressure ulcer at both elbow and heel area (Figure 2).

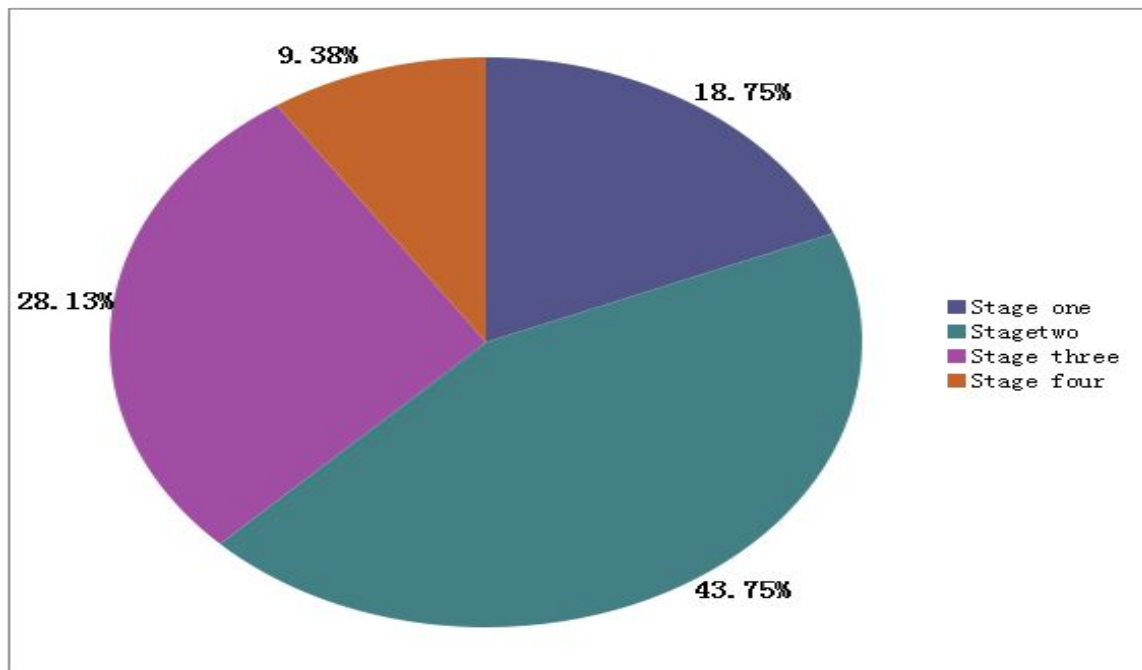


Figure 2: Pressure ulcer stages in WSUTH, Southern Ethiopia 2015.

Table 2: pressure ulcer Stages in WSUTH, Southern Ethiopia 2015 (n=32).

Variables		Frequency	Percentage (%)
Stages of pressure ulcer	Stage I	6	18.75
	Stage II	14	43.75
	Stage III	9	28.125
	Stage IV	3	9.375
Location of pressure ulcer	Buttock	18	56.25
	Sacrum	12	37.5
	Heels	1	3.125
	Elbow	1	3.125
Number of pressure ulcer	Single	22	68.75
	Bilateral	7	21.875
	Multiple	3	9.375
Pressure reducing devices user	Yes	6	18.75
	No	26	81.25

5.3 Length of Stay in hospital and Change of Patient's Position

Almost greater than half of admitted patients 146 (61.1 %) in Wolaita Sodo University Teaching Hospital had ≤ 6 days length of stay in the hospital, whereas 36(15.1%) patients stayed in hospital for more than 21 days. The mean hospital length of stay was 8 (interquartile range of 4–13) days. From pressure ulcer developed individuals, 26(81.25) have not used pressure relieving device; however, 6(18.75%) of patients used airings pressure relieving device.

Table 3: Frequency and percentage distribution of factors associated with pressure ulcer in WSUTH, Southern Ethiopia 2015 (n=239).

Variables		Frequency	Percentage (%)
Duration of hospital stay	≤ 6 days	146	61.1
	7-20 days	57	23.8
	≥ 21 days	36	15.1
General condition of the patient	Critically ill	83	35
	Bed ridden	53	22
	Satisfactory	103	43
Patients skin status	Healthy skin	116	48.5
	Dry skin	104	43.5
	Dehydrated skin	11	4.6
	Broken skin	2	0.82
	Edematous skin	6	2.5
Patient independent repositioning	Yes	157	65.7
	No	82	34.3
Activity	Bed bound	68	28.5
	Chair bound	32	13.4
	Walks occasionally	139	58.2
Nutrition	Very poor	56	23
	Probably inadequate	88	37
	Adequate	95	40
Friction and shear	Problem	60	25.1
	Potential problem	63	26.4
	No apparent problem	116	48.5
Circulation status of the patient	Direct capillary refill	115	48.1
	Delayed capillary refill	93	38.9

	Mild edema	26	10.9
	Moderate edema	5	2.1
Medication in use	Antidepressants	72	30.0
	Sedatives	59	25.0
	Vasopressors	38	16.0
	Antibiotics	70	29.0
Sensory perception of the patient	Completed limited	55	23
	Very limited	99	41
	No impairment	85	36
Moisture	Constantly moist	55	23
	Very moist	63	26
	Occasional moist	121	51
Mobility	Completely immobile	50	21
	Very limited	66	28
	Slightly limited	123	51

5.4 Factors associated with of pressure ulcer

Independent variables were analyzed in simple logistic regression with dependent variable of pressure ulcer to know their association. Those variables which were significant at $p \leq 0.25$ entered into multiple logistic regressions.

A multiple logistic regression analyze identified that length of stay in hospital, sensory perception, medication, activity status, general condition of the patient, patient's principal diagnosis, change of patient's position by nurses, and friction and shear had significant association with pressure ulcer. Those respondents who had stayed in hospital ≥ 21 days were 4 times (95% CI: 1.98, 12.00) more likely to develop pressure ulcer than those participants who had stayed ≤ 6 days. Those participants who had very limited sensory perception were 3 times (95% CI: 1.244, 4.64) at higher risk to develop pressure ulcer than those who had no impairment in sensory perception.

Those participants whose principal medical diagnosis diabetes mellitus were 4 times (95%CI: 2.135, 6.884) more likely to develop pressure ulcer than those who had pneumonia diagnosis. Those respondents whose general condition bedridden were 3 times (95%CI: 1.30, 4.456) more likely to develop pressure ulcer than that of whose general condition were satisfactory.

Those participants who had problem in friction and shearing forces were 2.2 times (95% CI: 1.85, 15.79) at high risk of developing pressure ulcer than those who had no apparent problems. Those respondents whose position were not changed by nurses were 3.2 times (95%CI: 1.34, 6.23) more likely to develop pressure ulcer than those whose position was changed by nurses.

Those respondents whose activity were bedbound was 2.3 times (95%CI: 3.24, 4.13) at higher risk of developing pressure ulcer than those who walk occasionally. Those participants who use antidepressant medications were 6 times more likely (95%CI: 1.420, 6.652) to develop pressure ulcer than those who uses antibiotic medications (Table 5).

Table 4: Simple logistic regression of selected variables predicting the likely hood of pressure ulcer in Wolaita Sodo University Teaching Hospital, Southern, Ethiopia, 2015 (n = 239).

<i>Variables</i>		<i>Pressure Ulcer</i>		<i>Crude OR(95%CI)</i>
		<i>Yes</i>	<i>NO</i>	
Patients principal diagnosis	Diabetes	10	61	3.269(1.359,7.864)
	Chronic renal failure	7	64	1.133(0.240,5.362)
	Acquired brain injuries	9	62	1.308(0.273,6.265)
	Pneumonia	6	20	1
Patient independent reposition	Yes	12	145	1
	No	20	62	2.136(1.007,4.532)
Change of patients position by nurses	Yes	7	72	1
	No	25	135	0.347(0.128,0.940)
General condition of patients	Critically ill	12	71	1.093(0.317,3.762)
	Bedridden	9	44	3.394(2.542,11.504)
	Satisfactory	11	92	1
Medication in use	Antidepressants	8	64	2.341(0.727,7.540)
	Sedatives	7	52	5.386(1.834,7.816)
	Vasopressors	8	30	2.107(0.503,8.377)
	Antibiotics	9	61	1
Age categories	18-28	8	72	1
	29-39	9	73	0.447(0.167,1.194)
	40-49	9	48	0.696(0.233,2.086)
	>50	6	14	0.533(0.614,4.113)

Table 4: continued

Duration of hospital stay	<=6days	14	132	1
	7-20days	11	46	0.551(0.220,1.383)
	=>21days	7	29	1.464(0.598,3.584)
Sensory perception	Completely limited	10	45	2.400(4.449,5.462)
	Very limited	13	86	6.615(4.703,6.760)
	No impairment	9	76	1
Activity	Bed bound	12	56	4.920(3.827,8.901)
	Chair bound	7	25	4.800(0.917,5.121)
	Walks occasionally	13	126	1
Mobility	Completely immobile	10	40	2.217(3.638,4.637)
	Very limited	8	58	2.333(1.114,8.224)
	Slightly limited	14	109	1
Nutrition	Very poor	10	46	4.333(1.718,9.568)
	Probable inadequate	13	75	15.553(1,995,16.879)
	Adequate	9	86	1
Friction and shear	Problem	11	49	1.088(4.235,5.435)
	Potential problem	13	50	1.487(0.322,6.870)
	No apparent problem	8	108	1

Table 5: Multiple logistic regression predicting pressure ulcer in adult inpatients in Wolaita Sodo

University Teaching Hospital, Southern, Ethiopia, 2015 (n = 239).

<i>Variables</i>		<i>Pressure Ulcer</i>		<i>AOR(95%CI)</i>
		<i>Yes</i>	<i>No</i>	
Patients principal diagnosis	Diabetes	10	61	4.116(2.135,6.884) *
	Chronic renal failure	7	64	0.260(0.021,3.253)
	Acquired brain injuries	9	62	4.640(0.242,8.001)
	Pneumonia	6	20	1
Change of patients position by nurses	Yes	7	72	1
	No	25	135	3.20 (1.34, 6.23) *
General condition of patients	Critically ill	12	71	0.386(0.055,2.706)
	Bedridden	9	44	3.01(1.30,4.456) *
	satisfactory	11	92	1
Medication in use	Antidepressants	8	64	6.016(1.420,6.652) *
	Sedatives	7	52	3.315(0.569,13.329)
	Vasopressors	8	30	0.910(0.90,9.253)
	Antibiotics	9	61	1
Duration of hospital stay	<=6days	14	132	1
	7-20days	11	46	2.72 (0.8, 5.9)
	=>21days	7	29	4.67 (1.98, 12.00) *
Sensory perception	Completely limited	10	45	1.673(0.244,3.656)
	Very limited	13	86	2.773(1.244,4.64) *
	No impairment	9	76	1
Activity	Bed bound	12	56	2.34 (3.24, 4.13) *
	Chair bound	7	25	1.34 (0.12, 1.43)
	Walks occasionally	13	126	1
Friction and shear	problem	11	49	2.28 (1.85, 15.79) *
	Potential problem	13	50	1.89 (0.79, 4.54)
	No apparent problem	8	108	1

AOR= adjusted odd ratio, 95%CI= confidence interval.

Note: * Represents variables having statistically significant association P<0.05.

CHAPTER SIX: DISCUSSION

The researcher characterized the sample of 239 patients, determined the prevalence of pressure ulcer at WSUTH and identified the factors associated with ulcer development.

The prevalence of pressure ulcer found in the present study 13.4% which is inconsistent with previously reported rates in German and Netherland (23).

The prevalence rates in the current study were lower than the 16.8% reported by Haileyesus G. et al, following a cross-sectional study involving 422 inpatients in Felege Hiwot referral hospital in the city Bahir Dar (29). This discrepancy might be due to different characteristics of participants, disease condition of patients, and the variation of length of stay in hospital and sample size.

The study conducted in Thailand showed that presence of pressure ulcer was significantly associated with the use of pressure ulcer preventive devices (35); nevertheless, in this study 26(81.25%) of pressure ulcer developed participants did not apply pressure relieving devices. The reason might be inadequacy of materials in the hospital or work overload of nurses in applying pressure relieving devices or may be due to poor awareness on the importance, nurses' workload or overlooking the problem.

According to the current study patients' total hospitalization time were associated with the occurrence of pressure ulcer. As the length of stay in hospital increased, the development of pressure ulcer also increased. More days of hospitalization were significantly associated with pressure ulcer. This finding was in agreement with the study conducted in the 3 Irish hospitals, more hospitalization stay of the patients strongly associated with development of pressure ulcer (33). This might be due to prolonged pressure and decrease of blood circulation in particular area.

Patients' ability to respond appropriately to pressure or pain stimuli was clearly related to the formation of Pressure ulcer in this study. All pressure ulcer developed patients had complained

of a 'diminished level' of sensation in this study and the majority of cases had 'very limited' sensory perception. This finding was in agreement with the study conducted in Sweden; pressure ulcers were most developed in patients who had very limitation in sensory perception (36). The possible reason might be that most of respondents participating in this study had very limited sensory perception.

The predictor of Braden sub element associated with developed pressure ulcer in hospitalized patients in this study was the problem of friction and shearing forces. This sub-item of the Braden element was revealed to be significantly related to pressure ulcer formation for the population studied in this thesis. This result was in agreement with the study conducted in Brazil (38).

In this study, the activity status was related to development of pressure ulcer. Most of admitted patients risk for the development of pressure in this finding was bed bound; the patients in my study had variation in activity levels. A finding Consistent with the results of study conducted in Thailand (39).The possible reason might be that patients with completely limited activity (bed bound) cannot perform activities and change their position without assistant and they are sliding down from the bed.

In this study, absence of change of patient's position by the nurse was associated with the development of pressure ulcer. A similar study was conducted in Taiwan, which revealed that occurrence of pressure ulcer was associated with the absence of change of patient's position by nurses (40). The possible reason might be that not reducing or eliminating high Interface pressures, not improving patient positioning, and not reducing or eliminating areas that are always at risk for pressure ulcer formation and lack of nurses awareness on turning patients regularly every two hours turning.

In this finding immobile, bedridden patients were significantly associated with the development of pressure ulcer. A similar study conducted in Nigeria showed that bedridden patients were dependent on caregivers for both repositioning and transfers, increasing the risk for exposure to the forces of friction/shear and subsequent development of pressure ulcers (41). The possible reason might be that lack of advocates of safe patient handling procedures, the use of glide sheets and patient transfer devices to reduce the deleterious effects of friction/shear on the skin.

Endocrine disease (diabetes mellitus) was the only co-morbid condition in this study that was predictor of pressure ulcer. The study conducted in German revealed that most of patients in who pressure ulcer developed had endocrine disease (42). The possible reason might be due to immunosuppressant characteristics of the diseases.

In this study, antidepressants were the only medication that was a significant predictor for pressure ulcer. A finding consistent with the results of previous study conducted in Greek who had a pressure ulcer develop received antidepressants. Moreover, the mean number of hours of antidepressant intake in patients who had stage II or higher pressure ulcer was significantly higher than in patients who remained ulcer-free. Evidence to support antidepressant as a predictor of pressure ulcer in admitted patients is increasing (43).

Limitation of this study

Limitation of the study was

- Use of a single study site that diminishes the generalizability of the study findings.
- Inter observer bias and misclassification bias.

CHAPTER SEVEN: CONCLUSION AND RECOMMENDATION

7.1 CONCLUSION

The prevalence of pressure ulcer was high among hospitalized patients. Prolonged length of stay in hospital, problem of sensory perception, activity status, and general condition of the patients, patient's principal diagnosis, and medications in use, change of patient's position by nurses and friction and shearing forces were significantly associated with the presence of pressure ulcer. Patients who had stayed in hospital for more than twenty one days and had problem in friction and shear were more liable to develop pressure ulcer.

7.2 RECOMMENDATIONS

Based on the findings of this study:

Recommendations to nurses:

- Nursing director should facilitate and strengthen the staffs to use pressure ulcer preventive devices.
- Nurses should practice change of patient's position every 2hours.

Recommendations to hospital administrators

The management of WSUTH should develop a strong emphasis on the prevention of hospital acquired pressure ulcers with commitment from all levels of the organization. This can be achieved through the followings:

- Health care professionals should be more informed about secondary conditions (risk factors for pressure ulcer development) that may occur in the course of patient's stay in the hospital rather than emphasis only on primary condition that warranted admission.
- Patient's relatives should be informed about the risk factors for the development of pressure ulcers since they are also fully involved in the care.
- Should provide on services training for health care workers concerning risk factors of pressure ulcer.
- Should consider predictors of pressure ulcer during scaling up of health workers program.

Recommendation to researchers

Researches of prospective (follow up) study required investigating the prevalence and associated factors of pressure ulcer for hospitalized patients.

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ANNEXES

Letter of Information about the Study

Dear patients/families!

I am Msc student in the school of graduate studies of Jimma University in department of Nursing and Midwife. I am conducting this study in partial fulfillment of the requirements for the Degree of Masters in Adult Health Nursing. My proposal has been approved by the Institution Review Board JUCHS , my 1st Advisor Professor Tefera Belachew, Dean of School of post graduate of , Jimma University and 2nd Advisor Mr. Ashagre Molla Lecturer in School of Nursing Jimma University. I have also received ethical approval from the University to conduct this study. Dear my participants, I would be grateful if you would participate in this study by completing this questionnaire. It is hoped that the findings of this study would help both the nursing management and staff as to be more aware of the associated factors for pressure ulcer development.

Be assured that the **information you provide** would be used for research purposes only and would be treated as **confidential** and **participation is completely voluntary.**

I have read the information on the title and aim of the study given above. The title and aim of the study was clear to me. I understood that participation in this study is completely voluntary and that if I want to withdraw from the study any time, I will not obliged to continue and I will withdraw from it at any time. I understand that there is no risk associated with participating in this study. So, I agree to this. Hereby I can give informed consent to participate to this study.

Name of unit _____

Signature of volunteer _____ Date _____

Principal Investigator: Melese Meleku Kuruche

Tel: No 0934282833

Email: melesemeleku@gmail.com

Thank You for your cooperation.

ANNEXES

The following Questionnaires will be used to assess prevalence and associated factors of pressure ulcer among adult in patients in Wolaita Sodo university teaching hospitals. The questionnaire has two parts please read all instruction at each part to choose and fill your answer.

Part A1: Socio-Demographic information of patients

S. No	Items	Coding categories
50	Sex	1. Male 2. Female
501	Age (in years)	1.18-28 3.40-49 2.29-39 4.>50
502	Marital status	1. Married 2. Single 3. Divorced 4. Widowed
503	Ethnicity	1. Amhara 2. Gurage 3. Wolaita 4. Tigray 5. Other (specify
504	Level of education	1. Illiterate 2. primary 3. secondary 4. above secondary

505	Religion	1. Protestant 2. Orthodox 3. Catholic 4. Muslim 5. Other specify _____
		1. ≤ 6 days 2. 7-20 days 3. > 21 days
507	Occupational status	1. Farmer 2. Merchant 3. House wife 4. Government employee 5. Other, (Specify)
508	Total estimated income?	Monthly ____ in Birr Resident a. Rural b. Urban

Part A2: Questionnaires showing description of pressure ulcer

509. Temperature(in $^{\circ}$ C)	-----
510. Circulation	0 .direct capillary refill 1 .delayed capillary refill 2 .mild edema 3 .moderate till severe edema
512. Skin Color	1. White 2. Red 3. Dark Olive 4. Black

513. Visual assessment of skin risk areas	1.Healthskin 2. Dry skin 3. Clammy skin 4. Dehydrated skin 5. Edematous skin 6. Broken skin
514. Patient’s Principal Medical Diagnosis	1.Diabetes 2. Chronic renal failure 3. Acquired brain injuries 4 .Others(specify)
516. Can the patient independently reposition himself or herself?	1.Yes 2.No
517. Is there evidence of the use of pressure reducing/relieving devices?	1.Yes 2.No
518. Are pressure reducing/relieving device(s) currently in use?	1.yes 2.No
519. If pressure reducing/relieving device(s) are present, please indicate TYPE of device(s) in use	-----
520. Is there evidence of a pressure ulcer on skin examination?	1. Yes 2. No
If you answered YES to above question, complete questions 520to 52 if you have identified that the patient has pressure ulcer(s)	
521. Total number of pressure ulcers present following a skin examination	-----

522. Location of pressure ulcer	1. Sacrum 2. Buttock 3. Heels 4. Elbow 5. Others
523. Stage of all pressure ulcers present on skin examination	-----
524. Number of ulcer	1. Single 2. Bilateral 3. Multiple
525. Were any of these pressure ulcers present on admission? (Check first 24 hours documentation)	1. Yes 2. No
If YES for No 525 how many pressure ulcer were present on admission?	-----
526. General condition of the patient	1. Critically ill 2. Bedridden 3. Satisfactory
527. Two hourly change of position	1. Yes 2. No

528. Medications in use

1. Antidepressant

2. sedatives

3. vasopressors

4. Others (specify)

Part B: Tools used to assess associated factors of pressure ulcer.

Complete each item from 1-4 or 1-3

529. Patient name-----

Ward-----

Hospital name-----

Sensory perception		Moisture		Activity		Mobility		Nutrition		Friction & Shear	
No impairment	4	Rarely moist	4	Walks frequently	4	No limitations	4	excellent	4		
Slightly limited	3	Occasionally moist	3	Walks occasionally	3	Slightly limited	3	adequate	3	No apparent problem	3
Very limited	2	Very moist	2	Chair bound	2	Very limited	2	Probably inadequate	2	Potential problem	2
Completely limited	1	Constantly moist	1	Bed bound	1	Completely immobile	1	Very poor	1	No problem	1

Declaration

I, Melese Meleku Kuruche hereby declare that this research report entitled prevalence and associated factors of pressure ulcer among adult inpatients at Wolaita Sodo University Teaching Hospital in SNNPR Ethiopia has been prepared and submitted in fulfillment of the requirements of the Msc degree in Adult health nursing Program. This is my original work and that all sources that have been referred to have been fully indicated and acknowledged with complete references, and the research has not been presented for a degree in any other university.

Name: Melese Meleku Kuruche.

Sign _____ Date _____

APPROVED BY:

First Advisor: Prof. Tefera Belachew (MD, Msc, PhD)

Sign _____ Date _____

Second Advisor: Mr. Ashagre Molla (BSc.N, Msc)

Sign _____ Date _____

Name of the institution: Jimma University

Date of submission: