



## Prevalence of Pressure Injury in Inpatients at H. Adam Malik Hospital Medan in 2020-2022

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### ABSTRACT

**Background:** Pressure injury is a frequently occurring health issue in healthcare environments, especially within hospitals. The risk increases in patients who are confined to bed or wheelchair for a long time. **Objectives:** This study aims to describe the prevalence of pressure injury in regular inpatients at H. Adam Malik Hospital, Medan from 2020 to 2022. **Methods:** This study employs a descriptive design with a cross-sectional research approach, describing all variables using secondary data from patient medical records. **Results:** The research findings indicate that the most common age group is 41-60 years old (28,4%), with females comprising the majority (52,9%). The primary diagnoses related to the occurrence of pressure injury is neurological disorders (25.5%). The most frequent location of injury is the buttocks region (45.1%), and the most prevalent stage of injury is stage III (36.3%), with the most common management approach being debridement (43.6%). **Conclusion:** Most of pressure injury patients were in the 41-60 years age group, female, with a primary diagnosis of neurological disorders, located on the buttocks region, at stage III, and using debridement management.

**Keyword:** Age, Pressure Injury, Risk Factor, Stage, Underlying Disease

### ABSTRAK

**Latar Belakang:** Ulkus Dekubitus merupakan masalah kesehatan yang sering terjadi di lingkungan perawatan kesehatan, terutama di rumah sakit. Risiko ini meningkat pada pasien yang terbaring di tempat tidur atau kursi roda dalam waktu yang lama. **Tujuan:** Mengetahui gambaran Ulkus Dekubitus pasien rawat inap reguler di RSUP H. Adam Malik Medan pada tahun 2020 - 2022. **Metode:** Penelitian ini merupakan studi deskriptif dengan rancangan penelitian cross-sectional yang seluruh variabel dilihat menggunakan data sekunder berupa rekam medis pasien. **Hasil:** Penelitian ini menunjukkan bahwa kelompok usia yang paling banyak menderita ulkus dekubitus adalah usia 41-60 tahun (28,4%), dengan mayoritas adalah perempuan (52,9%). Diagnosis utama yang berhubungan dengan terjadinya ulkus dekubitus adalah gangguan neurologis (25,5%). Lokasi ulkus yang paling sering adalah daerah bokong (45,1%), dan derajat ulkus yang paling banyak terjadi adalah stadium III (36,3%), dengan penatalaksanaan yang paling banyak dilakukan adalah debridemen (43,6%). **Kesimpulan:** Mayoritas penderita ulkus dekubitus merupakan kelompok usia 41-60 tahun, wanita, dengan diagnosis utama gangguan neurologis, lokasi di bokong, derajat III, dan menggunakan tata laksana debridemen.

**Keyword:** Derajat, Diagnosis Utama, Faktor Risiko, Ulkus Dekubitus, Usia



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## 1. Introduction

Decubitus ulcer or pressure injury is wounds on specific regions of the body that are caused by excessive pressure and typically affect the skin layer.<sup>[1]</sup> This condition develops when a person lies down and remains

motionless for an extended period. Repeated pressure on body parts can result in ischemic damage to soft tissue, potentially causing tissue necrosis or ulceration.

Pressure injury can develop at any age, but patients over 70 account for about two-thirds of incidents.<sup>[2]</sup> Pressure injury is generally classified into six stages, namely stage I, stage II, stage III, stage IV, unstageable, and deep tissue pressure wounds.<sup>[1]</sup>

According to research findings from Septian et al<sup>[1]</sup> pressure injury was identified as the prevalent skin condition at H. Adam Malik General Hospital in 2016 (48.7%). Incidence of pressure injury was found to be approximately 8% in a study involving 1132 patients in four Indonesian hospitals, with 44% of patients experiencing pressure injury while hospitalized. There were 42% of the wounds falling into the stage III and IV.<sup>[4]</sup> The possibility of nosocomial infections occurring in hospitals lends credence to this.<sup>[5]</sup> Nevertheless, no study has been conducted to depict the condition of patients with pressure injury at H. Adam Malik General Hospital from 2020 to 2022. This study was carried out to ascertain the prevalence and characteristics of pressure injury in regular inpatients at H. Adam Malik General Hospital.

## 2. Method

This descriptive study with a cross-sectional research design was conducted using medical record data of regular inpatients with pressure injury who were treated in H. Adam Malik General Hospital, Medan, from January 1, 2020, to December 31, 2022.

The complete and collected sample of medical records of regular inpatients with pressure injury were 102 medical records. Demographic data regarding age, gender, the primary diagnosis as the cause of pressure injury, the distribution of location and stage of pressure injury based on classification according to National Pressure Injury Advisory Panel (NPUAP), and management used.

After obtaining research permission, researchers collected medical record of regular inpatients with pressure injury. Demographic characteristics were collected and recorded in Microsoft Excel software for further accumulation and screening. The complete medical record data then included in the study for further investigation.

Statistical analyses were performed using Microsoft Excel 2016 (Microsoft Corp., USA) and SPSS software version 25.0 (IBM Corp., USA). Demographic data (age, gender, primary diagnosis, location, stage, and management of pressure injury) are presented as frequencies and percentages. The data was analyzed univariately and presented in the form of tables and descriptive statistics.

The study was approved by the Ethics Committee, Faculty of Medicine, Universitas Sumatera Utara (No. 694/KEPK/USU/2023).

## 3. Results

Of the 153 medical records enrolled in this study, 102 were finally included. Of all the medical records, 29 data (28.4%) were in the largest age group of 41–60 years, while seven data (6.9%) were in the lowest age group of  $\leq 20$  years. The majority of gender-specific was women (54/102; 52.9%) exceeded men (48/102; 47.1%) (Table 1).

**Table 1.** Participant Characteristics

Variable	N = 102	%
<b>Age (years)</b>		
$\leq 20$	7	6.9
21-40	17	16.7
41-60	29	28.4
61-70	26	25.5
>70	23	22.5
<b>Gender</b>		
Female	48	47.1
Male	54	52.9

Based on the primary diagnosis, it was found that neurological disorders had the highest percentage (25.5%), consisting of cerebrovascular disease (CVD) (ischemic and hemorrhagic stroke), central nervous system (CNS) trauma, arachnoid cysts, hernia nucleus pulposus (HNP), and spondylolisthesis. Musculoskeletal disorders (include bone fractures, osteomalacia, gouty arthritis, and musculoskeletal tumor) and malignancies (breast cancer, hepatocellular carcinoma, rectal cancer, leukemia, brain cancer, and metastatic cancer) were the second in order. Infectious diseases came in third place (HIV/AIDS, epidural abscess, TB meningitis, and TB spondylitis). Subsequently, afflicted by gastrointestinal disorders, which included liver cirrhosis and upper digestive tract bleeding (Table 2).

**Table 2.** Primary Diagnosis as The Cause of Pressure Injury

<b>Variable</b>	<b>N = 102</b>	<b>%</b>
<b>Primary Diagnosis</b>		
Neurological disorder	26	25.5
Infectious disorder	8	7.8
Malignancy	16	15.7
Musculoskeletal disorder	16	15.7
Gastrointestinal disorder	7	6.9
Cardiovascular disorder	5	4.9
<b>Other diagnoses</b>		
Type 2 diabetes melitus	6	5.9
Chronic renal failure	7	6.9
Geriatric syndrome	7	6.9
Systemic lupus erythematous	4	3.9

Pressure injury may occur in multiple locations, accounting for the 113 responses reported. The distribution of pressure injury locations showed the most common location was the buttocks region (45.1%) followed by the back region. Meanwhile, the least frequent locations were the anal, hand, and hips, with each having one data (Table 3). Additionally, stage III pressure injury (36.3%), were the most prevalent type in this study then followed by stage II and stage IV (Table 3).

**Table 3.** Distribution of Location and Stage of Pressure Injury

<b>Variable</b>	<b>N = 113</b>	<b>%</b>
<b>Location</b>		
Anal	1	0.9
Buttocks	51	45.1
Leg	7	6.2
Inner thigh	4	3.5
Hips	1	0.9
Back	25	22.1
Sacral	20	17.7
Hand	1	0.8
Heel	3	2.6
<b>Stage</b>		
I	6	5.3
II	35	31.0
III	41	36.3
IV	30	26.5
Unspecified	1	0.9
Deep tissue	0	0.0

Each participant may receive more than one treatment for pressure injury; thus, there were 165 responses in total. Debridement was the common form of treatment, while nutritional therapy was the least form of treatment (Table 4).

**Table 4. Management of Pressure Injury**

Variable	N = 165	%
<b>Management</b>		
Debridement	72	43.6
Pressure therapy	31	18.8
Infection and pain control therapy	59	35.7
Nutritional therapy	3	1.8

#### 4. Discussion

Pressure injury was most common in adult to elderly patients, with women making up the majority of the gender distribution.<sup>[6,7]</sup> Previous study conducted at Arifin Achmad General Hospital, Riau Province, found that the largest age group was 46-65 years.<sup>[6]</sup> This finding was in line with our study where the largest age group of participants was 41-60 years. Rahasti et al., also showed that 18.7% of pressure injury patients at H. Adam Malik Hospital between 2012 and 2014 were in the 35-45 and >65 age range, providing additional support for this study. The findings of other studies support the notion that age raises the risk of pressure injury.<sup>[8,9]</sup> The physiological process of skin aging, blood vessels, and other connective tissues results in thinning of the epidermis and dermis, which causes a lack of skin compensation for pressure, friction, and the transport of oxygen and nutrients. As a result, elderly people are at a high risk of developing pressure injury.<sup>[10]</sup> Aside from that, older adults frequently suffer from other illnesses like diabetes mellitus that have been associated to poor wound healing.<sup>[11]</sup>

In our study, women had a higher percentage than men at developing pressure injury. This is consistent with earlier studies that demonstrate that women outweigh men, with a percentage of 74.6%.<sup>[10]</sup> The Global Burden of Decubitus Ulcers report, which covered the years 1990 to 2019, showed that while women had a significantly higher percentage than men, men under the age of 70 were much more probable than women to have pressure injury. Gender is still a topic of discussion among researchers as a number of them have expressed differing views.<sup>[8]</sup> These findings corroborate the gender and age cross tabulations in our study, which indicate that there are more women over 70 than men.

Long-term immobilization and the resulting friction can usually lead to skin abrasion and damage to the epidermal layer, while tissue tearing can cause internal structures like muscles to be damaged and blood vessels to become occluded.<sup>[10]</sup> Our result on the distribution of pressure injury location and degree showed that most people had stage III ulcers (17.7%) in the buttocks region, followed by stage II ulcers (8.8%) in the back region. These findings are consistent with a study conducted at Dustira Cimahi Hospital by Wahyudin et al., which found that 66% of patients had pressure injury in the sacrococcygeal region up to the ischium, with stage III being the highest degree. This may be brought on by the fact that the back and buttocks are frequently the points of greatest contact between the body and the surface of the chair or bed. Persistent pressure on these areas can cause blood flow disruption and cellular necrosis because the tissue has less access to oxygen and nutrients.<sup>[12]</sup>

In this study, it was found that the primary diagnosis of pressure injury patients was predominantly related to neurological disorders (25.5%). Previous study stated that patients with pressure injury usually have neurological disease. Approximately 50.5% of patients with severe pressure injury also suffer from neurological conditions.<sup>[13]</sup> Based on study in Alito et al found that pressure injury affected up to 16.05% of patients receiving neurological rehabilitation.<sup>[14]</sup> The inclination of neurological disease patients to remain immobile and bedridden will decrease the amount of oxygen and nutrients that are transported to the area. Furthermore, poor nutrition brought on by difficulty swallowing and eating will hinder the healing of pressure injury. Preventive measures include reducing bed rest and increasing physical activity, as well as keeping an eye on the patient's protein and calorie intake.<sup>[15]</sup>

Our study revealed that musculoskeletal disorders (15.7%) and malignancies (15.7%) are the second most commonly diagnosed diseases, both of which are lifelong conditions. Other studies have shown that pressure

injury occur in 44% of vertebral fractures and 55% of pelvic fractures.<sup>[16]</sup> In another study, 29.5% of patients with a malignancy diagnosis had pressure injury.<sup>[12]</sup> The patient's mobility must be restricted during this treatment. The blood supply to skin and subcutaneous tissue is hindered due to the average capillary pressure being lower than the local tissue pressure, which results in hypoxia and necrosis. In this instance, inadequate nutritional factors are also a factor.<sup>[12,16]</sup>

Infectious diseases came in third place with a total of 7.8% cases including TB meningitis, spondylitis, HIV/AIDS, and epidural abscesses. This is consistent with other research that shows a 2.1% and 18.2% prevalence of pneumonia and recurrent urinary tract infections, respectively.<sup>[15]</sup> Infection is the invasion of pathogenic bacteria that causes a catabolic state and tissue damage. This will impede or at least slow down the healing of wounds. In light of this, the risk of pressure injury will rise dramatically. Malnutrition, dysphagia, urinary catheterization were common problems in patients with chronic diseases and increase the risk of infections such as aspiration pneumonia, urinary tract infections, as well as soft tissue-related infections, sepsis, and osteomyelitis.<sup>[15]</sup> Skin moisture balance is crucial to prevent friction wounds, skin irritation, and microbial colonization. Skin moisture levels should be at their optimal level. Several preventive measures include using topicals (cream and zinc oxide ointment), avoiding catheter use, using disposable diapers and toilets, washing hands, and getting immunized.<sup>[17]</sup>

The study revealed that geriatric syndromes (6.9%), chronic renal failure (6.9%), diabetes mellitus (5.9%), and cardiovascular disease (4.9%) accounted for only a small percentage of the diagnoses identified. Chronic renal failure and geriatric syndrome are brought on by age-related abnormalities in homeostatic function, such as anemia and electrolyte imbalances, which result in poor perfusion. Chronic diabetes conditions contribute to vascular glycosylation that disrupts perfusion, causing local ischemia of the skin. In addition, cardiovascular disease with low cardiac output and/or decreased oxygenation causes hypotension, decreased blood perfusion, and peripheral ischemia associated with pressure injury.<sup>[16]</sup>

In terms of pressure injury distribution, our study revealed that the buttocks (45.1%) and sacrum (17.7%) were the most frequently reported locations. Studies by Amirsyah et al. found that 15% to 25% of pressure injury occur in the lower extremities, typically the heel or lateral malleolus, and that 70% of them occur in the sacrum, ischial tuberosity, or greater trochanter lateral.<sup>[18]</sup> However, other studies stated that the location of pressure injury is consistently most often in the sacrococcygeal area in the range of 48.7-49.3%, followed by the heel area at 20%.<sup>[19]</sup> The sacrococcygeal area is the one that is most frequently affected by pressure injury because it is the area that is subjected to pressure from bed rest and extended sitting, all of which force these patients to be immobilized. Moreover, using a moisturizer will increase humidity, lessen friction, and stop potential infection processes.<sup>[20]</sup>

Our study revealed that degrees II (41.0%) and III (36.3%) were the most common degrees experienced by pressure injury patients. This is in line with other research which stated that degrees II and III were the most common degrees with percentages of 43.3% and 22.4%, respectively. The reason for this could be attributed to the medical staff's lack of involvement and the patient's family's ignorance when it comes to providing care, such as shifting positions and checking for the possibility of pressure injury in patients who are at risk or who have already experienced pressure injury prior to admission, so that patients with stage I pressure injury go unnoticed and are only identified when the ulcer reaches stage II.<sup>[10]</sup> In contrast to research conducted in Portuguese hospitals, the highest degree of pressure injury is stage II and sequentially up to stage IV. There exists a correlation between the duration of hospitalization and the severity of pressure injury. Pressure injury severity increases with patient treatment duration.<sup>[20,21]</sup>

Depending on the extent of the necrotic tissue, debridement of the necrotic tissue and abscess drainage are required in the treatment of pressure injury. Initial debridement can be performed in the operating room. Management of Pressure Injury can be carried out simultaneously with other treatments according to the patient's needs.<sup>[22]</sup> In this study, debridement was the most frequently performed treatment (43.6%), followed by infection and pain control therapy (35.7%) including the application of dressings. Another study found that, with a percentage of 27.2%, debridement was the second most commonly used treatment, after hydrogel dressing, which accounted for 33.9% of cases.<sup>[23]</sup>

The first step in managing pressure injury is to relieve pressure at the wound site. It is necessary to regularly rearrange the sleeping position and apply the dressing. Additionally, in order to lower pressure, patients require a special bed. An important part of the initial evaluation of a pressure injury is to determine whether there is

evidence of an infection. Pressure injury should be examined for surrounding erythema or fluctuation. In the event of a necrotizing soft tissue infection, crepitus is a more dangerous condition that needs to be evaluated promptly. Patient referral to the operating room for appropriate abscess drainage and debridement is necessary if infection control measures are not sufficient. The next step is to administer enough nutritional therapy and wound dressings to encourage wound healing. Since most participants were in stage III in our study, the best course of action was to perform debridement.<sup>[22]</sup>

This study had several limitations, First, the study design did not cover the cause and effect relationship between pressure injury and risk factors. Second, our study was conducted with a single-center experience so it does not represent the general population in Indonesia. It is necessary to conduct additional research using larger specimens and more varied parameters, such as the types of bacteria present in pressure injury, the kind of debridement technique used, and the type of inpatient room used.

## 5. Conclusion

This study reported the characteristics of pressure injury patients who were regularly hospitalized at H. Adam Malik Hospital in 2020-2022. The distribution of age and gender is highest in the 41-60 year age group with a predominance of women. The most frequently identified primary diagnosis was neurological disorder with the majority location being in the buttocks region. The most frequently reported degree of pressure injury was stage III. The most common treatment was debridement. Generally, pressure injury was described as occurring in patients at our institution at a fairly high severity and primarily in older adults.

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