

Pressure ulcer prevalence among hospitalised adults in university hospitals in South-west Nigeria

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ABSTRACT

Pressure ulcers are recognised universally as a largely preventable patient safety problem and a measure of the quality of care provided by health institutions. The prevalence of pressure ulcers among hospitalised patients in Nigeria has been sparingly reported. This study investigated the prevalence of Stages II to IV pressure ulcers among hospitalised adults in the six university hospitals in South-west Nigeria.

Participants were all hospitalised adult patients in the six university hospitals in South-west Nigeria. Data collected included age, gender, anatomical location of the pressure ulcer, and presence/absence of a relative by the patient's bedside.

The mean age of patients with Stage II pressure ulcer and higher was 47.0 ± 21.2 years. Prevalence of Stages II to IV pressure ulcers ranged between 0% and 6.9% in the hospitals and overall prevalence was 3.22%. Prevalence rates in male and female patients were 3.59% and 2.83% respectively. The most common anatomical locations for pressure ulcer were the ischial tuberosity, sacrum and greater trochanter. Most (92.3%) of the patients that had pressure ulcers also had relatives staying at their bedsides.

The prevalence of Stages I to IV pressure ulcers observed in this study was similar to rates reported from studies in which Stage I ulcers were similarly excluded while relatives' presence by patients' bedsides appeared not to have deterred the development of pressure ulcers.

Keywords: pressure ulcer, prevalence, hospitalised adults, university hospitals, South-west Nigeria.

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Key points on what is already known on the topic

- Pressure ulcers affect millions of people worldwide.
- Pressure ulcers nearly always occur over bony areas of the body where pressure and therefore tissue distortion is greatest.
- The sacrum/coccyx area and the heels are the most common sites for the development of pressure ulcers as they account for 50% of all ulcers.

Key points on what our manuscript contributes

- Empirical data on the prevalence of pressure ulcer in Nigeria (a developing country) are made available. This can be used for international comparisons.
- Presence of a relative by the patient's bedside for the purpose of positioning and turning of patients may not be effective in reducing the prevalence of pressure ulcer among hospitalised adults.
- The prevalence rate of a Stage II pressure ulcer and higher is similar to rates from similar studies.
- These differences could be examined in further studies because the lower prevalence rate found in this study may be as a result of differences in study methodology in relation to other studies.

INTRODUCTION

Pressure ulcers remain a significant problem in hospitals as well as domestic and community settings¹. They have been described by both the National Pressure Ulcer Advisory Panel (NPUAP) and the European Pressure Ulcer Advisory Panel (EPUAP) as localised injury to the skin and/or underlying tissue usually over a bony prominence as a result of pressure combined with shear² and it has long been recognised as a major cause of morbidity, mortality and health care burden globally³. Although largely preventable, pressure ulcers affect millions of people worldwide and consumes billions of dollars in health care spending⁴. This largely preventable patient safety problem is recognised universally as one of the five most common causes of harm to patients⁵, and is increasingly being described as an indicator of the quality of care provided by health care organisations^{6,7}. Pressure ulcers hence have detrimental physical, social and functional consequences for individuals, health services and the community^{8,9}.

Advanced age has been identified as a major contributing factor to the development of pressure ulcers¹⁰, but the greatest risk factor to the formation of pressure ulcers is the loss of independent mobility, which is more common in patients in intensive care units than for other patients¹¹. Patients with conditions associated with loss of mobility and sensation such as individuals with spinal cord injury may not be able to move to relieve pressure or may not even be aware that a part of the body is under duress and may hence be predisposed to developing pressure ulcers. However, failure of sensation or of appreciation of pain may be more important than poor mobility in pressure ulcer aetiology since patients with diseases affecting mainly mobility but without sensory loss, seldom develop pressure ulcers while those with largely sensory loss and little or no motor paralysis readily develop ulcers¹².

Pressure ulcers nearly always occur over bony areas of the body where pressure and therefore tissue distortion is greatest¹² and are graded or staged to classify the degree of tissue damage. Eighty-five to 95% of all pressure ulcers have been reported to develop over bony prominences on the lower half of the body viz: sacrum, trochanters, ischia, heels and lateral malleoli¹¹. The sacrum/coccyx area and the heels are identified as the most common sites for the development of pressure ulcers as they jointly account for 50% of all cases⁷.

Reliable prevalence data on pressure ulcers has been difficult to obtain due to methodological differences¹³. These differences may be related to variations in definitions of prevalence and incidence (that is, the differences between them and the interpretations that can be placed on them); how the outcomes were derived; how the studies were conducted; care setting/patient population studied; use of different ulcer classification systems; multiple sources of data and varying methods of obtaining data¹⁴. However, it is generally estimated that pressure ulcer prevalence in acute care settings is 15% while the incidence is 7% though the prevalence may be as high as 30%^{14,15}. A prevalence of 23.9% was reported for university hospitals in Sweden¹⁶, 28.7% for Dutch intensive care units¹⁷ and 8.9% was reported in Iceland¹⁸. A review of all available data from prevalence studies of pressure ulcers conducted over a 13-year period indicated that 26%

of patients admitted in Canadian health care settings developed pressure ulcers¹⁹. Although there is extensive published information on the prevalence of pressure ulcers in many countries of the world, there is currently a dearth of literature on the prevalence of pressure ulcers among patients admitted to Nigerian hospitals generally and university hospitals in particular. One of the two recent publications on pressure ulcers in Nigeria that is available for referencing focused on the incidence of pressure ulcers among high-risk inpatients²⁰ while the other was on the prevalence of hospital-acquired pressure ulcers among patients with spinal cord injury²¹. The two studies are hence limited in scope and different in focus from this study. Pressure ulcer prevalence is a good indicator of a health facility's pressure ulcer problem while pressure ulcer incidence is a measure of the health facility's quality of care. Furthermore, 70.3% of participants in a study on nurses' knowledge on pressure ulcer prevention that was conducted in a teaching hospital in South-west Nigeria had a low knowledge score and the authors concluded that pressure ulcer prevention interventions in the country are based on tradition²². Hence, findings on the prevalence of pressure ulcers from outside Nigeria may not be validly extrapolated to Nigeria. Although Onigbinde *et al.*²³ appeared to be suggesting that pressure ulcers occur in 9% of Nigerian patients during the first two weeks of hospitalisation, the source of the data is not clear as the study being cited was a case study. The prevalence of pressure ulcers among adults hospitalised in university hospitals located in South-west Nigeria was hence investigated in this study as an initial step to providing empirical information on the prevalence of pressure ulcers in Nigeria.

METHODS

Participants were adults in all adult hospital wards in the six university hospitals located in the south-western geopolitical zone of Nigeria. Nigeria is divided into six geopolitical zones of six states each. The south-western zone comprising Ekiti, Lagos, Ogun, Ondo, Osun and Oyo states is the home to the Yorubas who constitute 12.6% and 13.7% female and male respectively of the Nigerian population. Approval of the University of Ibadan/University College Hospital Institutional Review Committee on human subject research was obtained before the commencement of the study and each subject gave oral informed consent to participate. We also obtained the approval of relevant authorities in the following university hospitals that were involved in the study: University College Hospital, Ibadan; Lagos University Teaching Hospital, Lagos; Lagos State University Teaching Hospital, Ikeja; Olabisi Onabanjo University Teaching Hospital, Sagamu; Obafemi Awolowo University Teaching Hospital, Ile-Ife; and Ladoko Akintola University of Technology Teaching Hospital, Osogbo.

An enumeration of all adult patients that were inpatients admission in the hospitals at the time of the study was conducted and those with pressure ulcers were identified following examination of all patients. A day was fixed for collection of data from each hospital. Data on established/identifiable pressure ulcers were collected by one of the researchers (LOA) who moved from ward to ward in each hospital and from one hospital to another using the Pressure Ulcer Point Prevalence Survey (PUPPS 3) Pressure Ulcer Staging System⁷. Only established or obvious pressure ulcers (that is, Stages II to IV) were

included in the survey since Stage I ulcers have been noted as being difficult to identify on darkly pigmented skins^{24,25}. The following data were then collected on the patients with pressure ulcer: age, gender, primary diagnosis, anatomical locations of the ulcer, and presence of at least one relative by the patient's bedside. Data on the presence of a relative by the patient's bedside were collected because positioning and turning are the main approaches to pressure ulcer prevention in Nigeria and such tasks are often left to the relatives because of the acute shortage of nurses and other health workers. The relatives were instructed in manual turning/positioning and skin hygiene and encouraged to carry such out every two hours.

Data analysis

Data were analysed using descriptive statistics of percentages, mean and standard deviation, as applicable. Prevalence was obtained by dividing the number of admitted patients with a pressure ulcer in each hospital by the total number of inpatients and multiplying by a factor of 100²⁶.

Results

Thirty-nine of the 1211 adult patients in all the six university hospitals had one or more Stages II to IV pressure ulcers, thus giving an overall prevalence of 3.22%. The patients with a pressure ulcer were aged 16 to 86 years with a mean of 47.04±21.23 years. Table 1 shows that the prevalence of pressure ulcers in the university hospitals ranged from 0% to 6.9%. Twenty-two (56.4%) of the patients with a pressure ulcer were male but pressure ulcer prevalence rates in male and female patients were 3.59% and 2.83% respectively.

Figure 1 shows the distribution of patients with pressure ulcers according to diagnostic categorisation. Eleven each (28.21%) of the patients with pressure ulcers had quadriplegia/paraplegia while one each (2.56%) had hemiplegia or burns. The anatomical distribution of pressure ulcers is presented in Figure 2. About 72% of the ulcers were located in the pelvic girdle region while 14.10% were located in

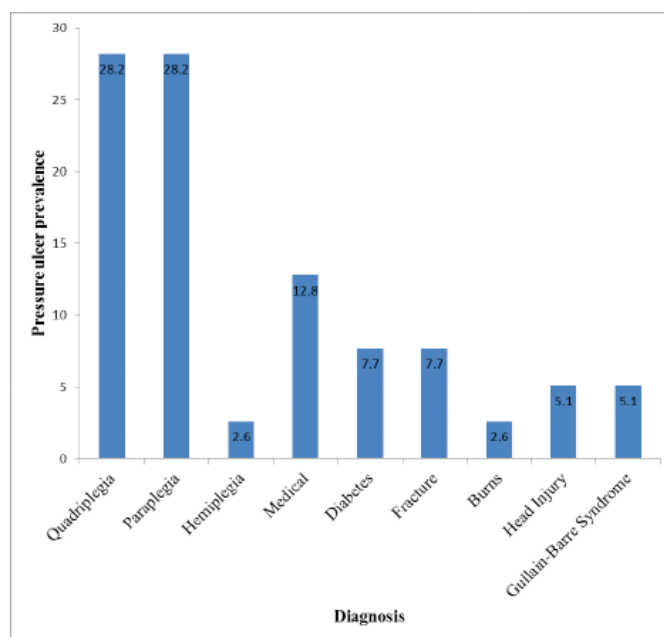


Figure 1. Pressure ulcer prevalence by diagnosis
Medical = Retroviral disease, seizure disorder, meningitis

the lower limb (knee region and below). The following anatomical locations accounted for 69.3% of the ulcers: ischium/buttocks — 43.6%; sacrum/coccyx — 18.0%; and heel — 7.7%. The most common anatomical locations of pressure ulcer were the ischial tuberosity (43.5%), sacrum (17.9%), greater trochanter (10.3%), lower back (8.9%) and heels (7.7%). Twenty-four (92.3%) of the patients with pressure ulcers had relatives staying with them during the daytime.

DISCUSSION

The prevalence of Stages II to IV pressure ulcers among hospitalised adults in the six university hospitals ranged from 0% to 6.9% while

Table 1: Distribution of pressure ulcer prevalence by hospitals surveyed

Hospital	Number of patients on admission	Number of patients with pressure ulcer	% Pressure ulcer prevalence
UCH a	319	16	5.02
LUTH b	301	9	2.99
LASUTH c	273	2	0.73
OOUTH d	94	2	2.13
OAUTHC e	145	10	6.90
LAUTTH f	79	0	0.00
Total	1211	39	3.22

a = University College Hospital, Ibadan

b = Lagos University Teaching Hospital, Lagos

c = Lagos State University Teaching Hospital, Ikeja, Lagos

d = Olabisi Onabanjo University Teaching Hospital, Sagamu

e = Obafemi Awolowo University Teaching Hospital Complex, Ile-Ife

f = Ladoke Akintola University of Technology University Teaching Hospital, Osogbo

the overall prevalence was 3.22%. Published rates of pressure ulcer incidence and prevalence vary and should be compared cautiously as inclusion criteria vary widely between studies^{17,20}. The prevalence in our study is considerably lower than the 23.9% reported for university hospitals in Sweden¹⁶, 28.7% for Dutch intensive care units¹⁷ and 26% reported in Canadian health care settings¹⁹. These differences in prevalence rates may be attributed to the different health care settings and study designs and because only Stages II to IV ulcers were involved in the study. The Dutch study involved patients admitted in the intensive care units while this study involved all adult patients that were inpatients in the teaching hospitals. In addition, the finding from Canada was based on a retrospective case file study, while this study was a cross-sectional survey. However, a prevalence as low as that obtained in our study (4.7%) was reported among hospitalised adults by Allman *et al.*²⁷ Further, 5.2% prevalence as against 11.7% prevalence was observed when Stage I pressure ulcers were excluded as in our study²⁸. Generally, the prevalence of pressure ulcers of Stage II or higher has been said to vary from 3% to 12% in hospitalised patients²⁹ and 1.2% to 11.3% among nursing home residents³⁰ hence the pressure ulcer prevalence in our study is in conformity with this norm. The pressure ulcer prevalence would definitely have been somewhat higher if Stage I ulcers have been included in our survey. The prevalence in our study is, however, lower than the 9.7% reported

for a hospital in South Africa in 1978³¹. We suspect that the prevalence from this study was lower because we involved only adult patients and excluded those with Stage I pressure ulcers. This could have equally accounted for the 0% prevalence recorded from one of the hospitals involved in the survey. Although zero percentage pressure ulcer prevalence as observed in one of the hospitals appears preposterous, it is possible since prevalence unlike incidence is determined at a point in time and may be affected by the length of hospitalisation of the patients when the survey was conducted. However, since the majority of the patients with pressure ulcers in the South African study were white, one is tempted to conclude that African blacks may generally be less susceptible to developing pressure ulcers. The lower prevalence rate reported in our study could also be attributed to differences in study methodology.

AGE DISTRIBUTION OF SUBJECTS WITH PRESSURE ULCERS

The mean age of patients with a pressure ulcer in our study was 47.04±21.23 years. This is comparable to 42.7±15.1 years²² reported for high-risk patients in Nigeria, the 37.41±12.18 years²¹ reported for Nigerians with spinal cord injury and the 53.59±22.05 years reported for university hospitals outside Nigeria³². The mean age of individuals with a pressure ulcer in this study may be further

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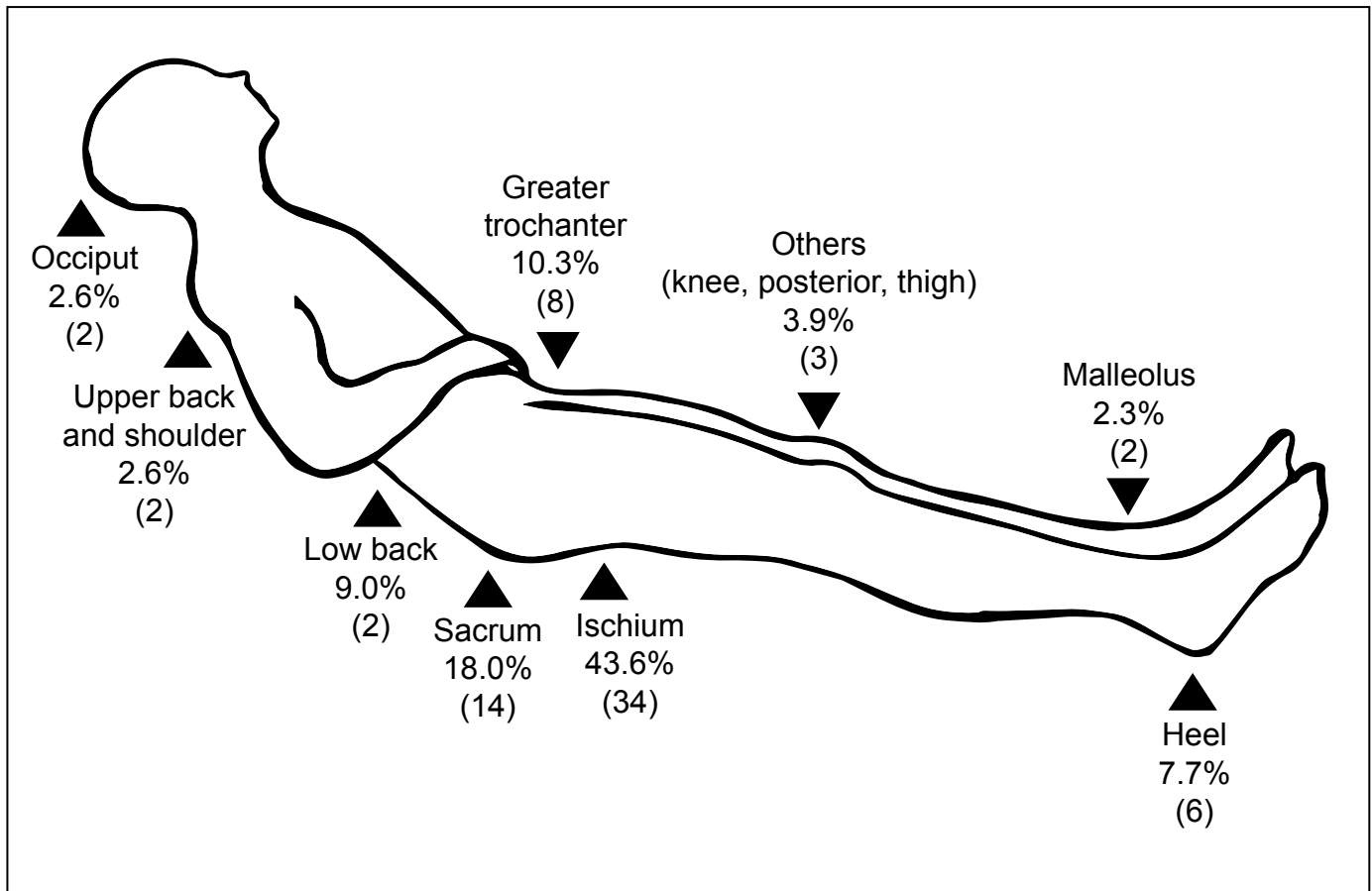


Figure 2. Anatomical distribution of pressure ulcers

evidence that length of hospitalisation and severity of illness are more important determinants of ulcer development than age-specific characteristics¹⁹. Prevalence of pressure ulcers appears to have a bimodal age distribution with a small peak occurring during the third decade of life as a reflection of those with traumatic neurologic injury³³. Incidentally, about 58% of patients with a pressure ulcer in this study had paraplegia or quadriplegia resulting from traumatic spinal cord injury, which could have accounted for the lower mean age of those with pressure ulcers.

GENDER DISTRIBUTION OF SUBJECTS

As reported in previous studies^{7,24}, we observed a higher prevalence of pressure ulcers in male patients. Thoroddsen¹⁸ reported prevalence of 7.12% and 11.2% among female and male patients respectively in their study compared to 18.4% and 17.2% reported in male and female respectively by the PUPPS 3⁷. However, in line with the generally lower prevalence of pressure ulcers observed in our study, the prevalence in males (3.59%) and females (2.83%) were appreciably lower than reported in literature. Our finding is in agreement with the view that the majority of younger individuals suffering from pressure ulcers are males; a reflection of the greater number of males suffering traumatic spinal cord injury³⁴.

PRIMARY DIAGNOSIS OF PATIENTS WITH PRESSURE ULCERS

Pressure ulcers were most prevalent in patients with quadriplegia and paraplegia, with 28.2% each. Our finding is consistent with the 51.6% reported for hospital-acquired pressure ulcers among patients with spinal cord injury in Nigeria²². The prevalence suggests that conditions which result in paralysis and impairment of sensation largely predispose to pressure ulcers. According to Bliss¹², this is so because these conditions also present with autonomic abnormalities which predispose patients to pressure ulcers even more than immobility. Maklebust¹¹, on the other hand, places emphasis on the immobility component by identifying the inability to move independently as the greatest risk for pressure ulcers.

INFLUENCE OF RELATIVES BY PATIENTS' BEDSIDES ON PRESSURE PREVALENCE

The presence of relatives by patients' bedsides seems like strange data to collect but not so in Nigeria where manual turning and positioning of patients are the major approaches to pressure ulcer prevention. This is especially relevant in the face of the acute shortage of nurses, hence the dependence on relatives to assist with their patients' positioning and turning. A large proportion of patients with pressure

ulcers in our study had their relatives at their bedsides during the day to facilitate manual turning as a means of preventing pressure ulcers. Proper positioning has been reported to have the advantage of ease of training for staff and family to carry it out²⁷. Hence, we assumed that the presence of relatives by patients' bedsides would enhance the effectiveness of carrying out preventive measures such as positioning and turning of patients, especially in a country like Nigeria where manual turning of patients remains the major method of preventing pressure ulcers. However, our finding that the majority (92.3%) of patients with pressure ulcers in this study had relatives by their bedsides may suggest that the relatives did not carry out the task as religiously as necessary to have the desired effect. In addition to the task of helping with tasks to prevent pressure ulcers, relatives also assist in running errands, such as paying hospital fees, collecting laboratory results and sometimes looking for drugs not available in the hospital pharmacy. These could have affected the relatives' ability to judiciously carry out the pressure ulcer prevention routines.

Unfortunately, this study was a point prevalence study; hence we had no opportunity to ascertain the extent to which the relatives indeed carried out the pressure ulcer prevention routines. Although our finding is in agreement with the opinion that the availability of help in skin care is not associated with pressure ulcers in spinal cord-injured patients, the conclusion from our study must be drawn cautiously

since our findings were not subjected to inferential statistics and we did not document the extent to which the relatives executed the pressure ulcer prevention routines that they were taught.

ANATOMICAL DISTRIBUTION OF PRESSURE ULCERS

The majority (86%) of the pressure ulcers seen in this study were located in the pelvic region and below while the common anatomical locations were ischial tuberosity, sacrum, greater trochanter, lower back and heels in descending order of prevalence. This is in agreement with the views of Maklebust¹¹ and Thoroddsen¹⁸ that most pressure ulcers occur below the waist and those of Bliss¹² and Gosnell¹³ that pressure ulcers mostly occur over bony prominences. The sacrum, followed by the heel, has been documented as the most common sites for pressure ulcer development³⁵. The sacrum/coccyx area and the heels have been documented to account for 50% of all pressure ulcers⁷. It has been proposed that the more fat and muscle in a muscle-bone interface, the more susceptible the area is to pressure ulcer development³⁶.

LIMITATIONS

An obvious limitation of our study is the exclusion of patients with a Stage I pressure ulcer (non-blanching erythema) from our survey because of the methodological difficulty of easily identifying a Stage



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I ulcer on darkly pigmented skin as this would have affected the pressure ulcer prevalence reported in this study. Notwithstanding this, the findings from this study, being the first on pressure ulcer prevalence among a diverse population of patients in Nigeria, represent a significant contribution to the literature on pressure ulcers. We also acknowledge our inability to document the extent to which the relatives carried out the pressure ulcer prevention routines as this was a cross-sectional point prevalence study.

CONCLUSION

It can be concluded that the mean prevalence of pressure ulcers among hospitalised adults in University Hospitals in South-west Nigeria is 3.22%, with higher prevalence in males and patients with quadriplegia and paraplegia. Pressure ulcers are most common in the pelvic region. The presence of relatives by patients' bedsides appeared not to have deterred the development of pressure ulcers.

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