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Bed Sores And Associated Risk Factors Among Hospital Admitted Patients: A Comparative Cross-sectional Study.

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Bed Sores and Associated Risk Factors among Hospital Admitted Patients: A Comparative Cross-sectional Study.

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ABSTRACT

Background: Bed sore (BS) is very common among hospital admitted patients. Bed sore is a localized injury to skin and underlying tissues due to pressure or friction and its incidence is affected by multiple factors.

Objective: This study was aimed to determine the incidence of bed sore and its potential risk factors among hospital admitted patients.

Material and Methods: This cross-sectional study was conducted among 108 hospital admitted patients in a tertiary care hospital of Lahore, Pakistan. Simple convenient sampling was used to enroll patients. After taking the informed consent from all patients, data was collected through a self-structured proforma. Data analysis was done via SPSS version 25. Chi square test was utilized to assess the association between bed sores and potential risk factors.

Results: The incidence of bed sore among study population was 14 (12.96%). Bed sores incidence was significantly associated with age group ($p=0.002$), educational status ($p=0.03$), socioeconomic status ($p=0.002$), awareness about bed sores ($p=0.001$), hospital stay length ($p=0.002$), limitation in movement ($p=0.0001$), diabetes mellitus ($p=0.03$), chronic kidney disease ($p=0.04$), obesity ($p=0.001$), history of hypertension ($p=0.002$), history of stroke ($p=0.02$), and history of heart disease ($p=0.04$), whereas, bed sores were not associated with gender significantly ($p=0.40$).

Conclusion: In a nutshell, the incidence of bed sores was significantly high among study population. Predisposing factors to the bed sores were advanced age, lower educational status, lower socioeconomic status, lower awareness about bed sores, longer hospital stay, limitation in movement, diabetes mellitus, obesity, history of hypertension, history of stroke, and history of heart disease.

Recommendations: This research recommends that people should make aware about the predisposing factors of bed sores and how to avoid these factors at every level and especially in hospitalized patients. Patients should change their position periodically. Obese patients should reduce weight. All patients, especially diabetic patients, should take care of skin.

Keywords: *Bed Sores, Risk Factors, Admitted patients.*

INTRODUCTION

Bed sore (BS) also known as pressure ulcer is characterized by an area of localized injury to skin and underlying tissues generally over the bony prominence secondary to pressure, friction, shear or mixture of these.^{1,2} BS goes from areas of marginally discolored skin to area of profound purulent injury pits that reach out to muscle and bone eventually.³ In literature, various studies have been reported the prevalence of BS among hospital admitted patients and it ranges from 1.80% to 46.70% in various groups of patients.²

BS affects a large number of people all over the world and increase the burden over the hospitals and their resources, especially in the developing countries which already have limited resources for health facilities. Patients who develop BS could go through pain, infection, sepsis, and disability which could bring social and economic problems for patients. Moreover, it could even lead to death of patients in few severe cases.² In United states of America every year almost 2.5 million patients came to acute facilities for pressures ulcers to get its treatment.⁴ It has been estimated that from every 1,000,000 patients who establish bed sores, 65,000 patients died due to complications that develop after the BS once developed.⁵

In literature, different researches that were conducted in various parts of the world, have shown that BS is linked with various risk factors which included age, gender, educational status, socioeconomic status, awareness about BS, hospital stay length, immobility, and chronic diseases (Diabetes mellitus, Chronic kidney disease, Obesity, Hypertension, Stroke, and Heart disease).^{1,2,6,7,8,9} Out of these factors some are modifiable, while others are non-modifiable, therefore, BS could be prevented or at least could be reduced in prevalence by working on controllable factors.

Even though, many studies have been conducted around the globe over bed sores, however, in literature, research work on bed sores in developing countries like Pakistan is insufficient, therefore, this study is aimed to assess the recent incidence of bed sores and their potential risk factors. After recognizing the factors that increase the BS incidence, BS could be prevented or its incidence could be brought down, by the implementation of appropriate measures for the control of these factors. The reduction in BS incidence could consequently bring improvement in the quality of lives of affected people and reduction in the burden over the restricted resources of the hospitals of developing countries.

MATERIAL AND METHODS

This comparative cross-sectional study was carried out among the chronic patients who were admitted in Medical Ward of a Tertiary care hospital Lahore, Pakistan in the time duration of 6 months from August 2021 to January 2022. 108 patients were recruited in the study according to the inclusion and exclusion criteria. We applied convenient type of sampling to enroll the patients. Only those patients whose stay in the hospital was more than 3 days and recurrent hospital visit (more than two hospital visits in in six month), willing to participate, and had any chronic disease (diabetes mellitus, obesity, hypertension, stroke, chronic kidney disease (CKD), and heart diseases) were selected. Those who were not willing to participate had hospital stay less than 3 days, had no recurrent hospital visit, and had no chronic disease were excluded from the study. Self-structured Proforma was used for the collection of data. After explaining the purpose of research, informed consent was taken from each participant. The self-structured Proforma had two components. In first component of Performa details relevant to demography like age

(Adults=below 40years or elder= above 40years), gender (male or female), socio economic status (lower=monthly income less than 30,000 or middle= monthly income more than 30,000), and educational status (below matric or above matric) were collected. In second component of Performa information regarding the risk factors of bed sores which included awareness of bed sores (yes or no), hospital stay (short=less than 10 days but more than 3days or long=more than 10 days) limitation in motion (yes or no), diabetes mellitus (yes or no), chronic kidney disease (yes or no), obesity (yes or no), history of hypertension (yes or no), history of stroke (yes or no), and history of heart disease (yes or no). Patients were divided into two groups. One group of patients with bedsores and other group of patients without bedsores. Bed sores diagnosis was made by the presence of localized injury to skin and other underlying tissues over the prominence of body like buttocks, heels of the feet, shoulder blades, back of knee, back of elbow, and back of the head, due to unrelieved pressure.

After the collection of data, SPSS version 25 was used to analyze data. We conducted a pilot study to check the reliability of self-structured proforma on 30 patients through the calculation of Cronbach alpha value. Its value was 0.770 which indicated high reliability of applied proforma. Descriptive and inferential statistics were applied for the evaluation of the study variables. Means and standard deviations were estimated for quantitative variables, whereas, for nominal variables frequency and percentages were computed. We applied Chi Square test to assess correlation between bed sores and associated risk factors. The p-value less than 0.05 was treated as statistically significant.

RESULTS

Out of 108 patients who were enrolled in the study 72 (66.66%) were males, whereas, 36 (33.34%) were females. The mean of age of study population was 46.19 years with SD (Standard Deviation) of ± 9.09 years. From the total of 108 patients, 14(12.96%) had bed sores, while, 94(87.04) had no bed sores. Figure 1 indicates the patient distribution on the basis of their gender.

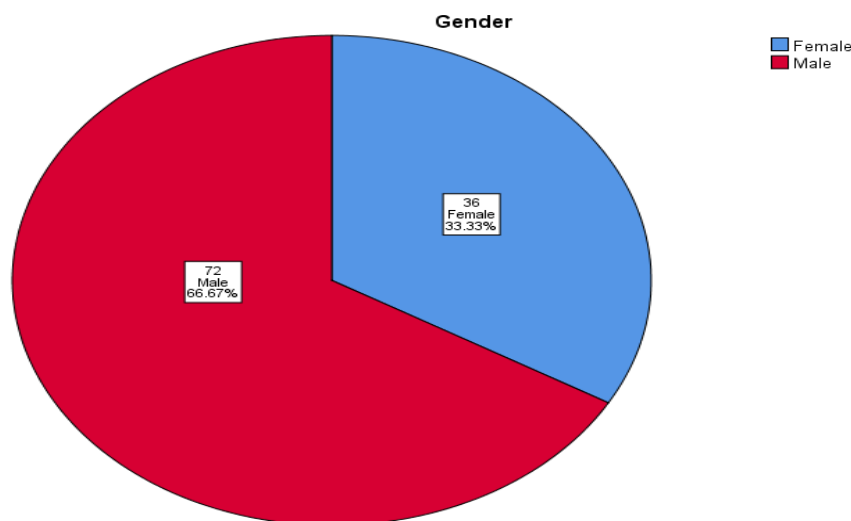


Figure 1: Gender based division of study population.

Figure 2 shows the incidence of bed sores among study population.

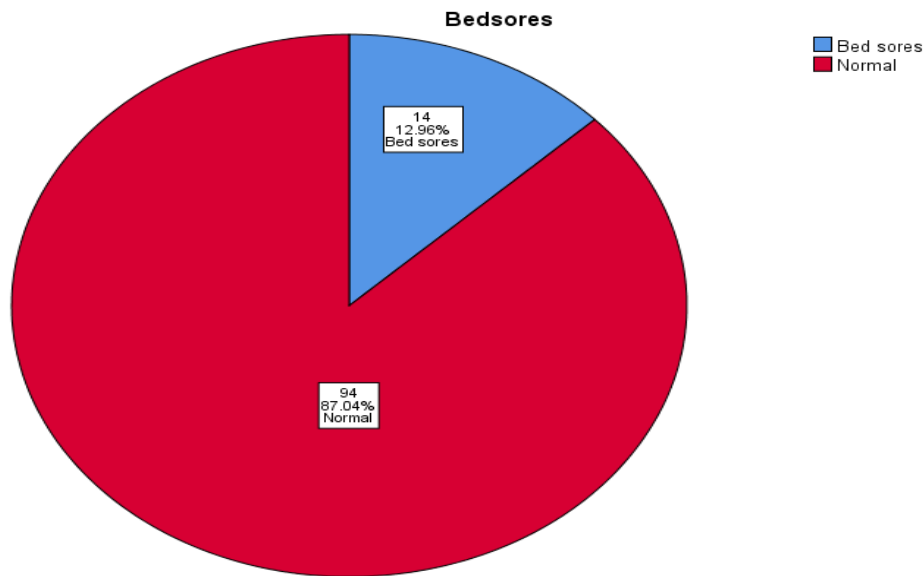


Figure 2: Incidence of bed sores in study population.

Table 1 manifests that bed sores are significantly associated with advanced age group ($p=0.002$), educational status ($p=0.03$), socioeconomic status ($p=0.002$), awareness about bed sores ($p=0.001$), hospital stay length ($p=0.002$), limitation in movement ($p=0.0001$), diabetes mellitus ($p=0.03$), chronic kidney disease ($p=0.04$), obesity ($p=0.001$), history of hypertension ($p=0.002$), history of stroke ($p=0.02$), and history of heart disease ($p=0.04$), whereas, bed sores were not associated with gender significantly ($p=0.40$). It shows that bed sores incidence was higher among the patients who had advanced age, lower educational status, lower socioeconomic status, lower awareness about bed sores, longer hospital stay, limitation in movement, diabetes mellitus, obesity, history of hypertension, and history of heart disease in comparison to patients who had young age, higher educational status, higher socioeconomic status, higher awareness about bed sores, shorter hospital stay, no limitation in movement, no diabetes mellitus, no obesity, no history of hypertension, and no history of heart disease. In case of chronic kidney disease, incidence of bedsores was higher among patients who had no chronic kidney disease, while, in case of stroke incidence was same in both patients who had stroke history and who had no stroke history. Moreover, the incidence of bed sores was independent of gender of patients. Although male patients had higher BS incidence than female patients.

Table 1: Association of risk factors with bed sores.

| Cross Tabulation and Chi-square Analysis | | | | |
|--|-------------------------------|-------------------------|----------------------------|------------------------|
| Parameter Total(n)=108 | | Chronic patient groups | | Chi-Square analysis |
| | | Group with Bed sores | Group without bed sores | |
| | | 14 (12.96%) | 94 (87.04%) | p-value |
| Age Group | Adult n=81 (75.00%) | 10 (71.42%) | 71 (75.54%) | 0.002 |
| | Elder n=27 (25.00%) | 4 (28.58%) | 23 (24.46%) | |
| Gender | Male n= 72 (66.66%) | 8 (57.14%) | 64 (68.08%) | 0.40 |
| | Female n=36 (33.34%) | 6 (42.86%) | 30 (31.92%) | |
| Educational Status | Below Metric n=69 (63.88%) | 10 (71.42%) | 59 (62.77%) | 0.03 |
| | Above Metric n=39 (36.12%) | 4 (28.58%) | 35 (37.23%) | |
| Socioeconomic Status | Lower Class n= 78 (72.22%) | 11 (78.57%) | 67 (71.28%) | 0.002 |
| | Middle Class n=30 (27.78%) | 3 (21.43%) | 27 (28.72%) | |
| Awareness of Bed sores | Yes n=39 (36.12%) | 1 (7.14%) | 38 (40.42%) | 0.001 |
| | No n=69 (63.88%) | 13 (92.86%) | 56 (59.58%) | |
| Hospital Stay Length | Longer n=34 (31.48%) | 12 (85.72%) | 22 (23.41%) | 0.002 |
| | Shorter n=74 (68.52%) | 2 (14.28%) | 72 (76.59%) | |

| | | | | |
|------------------------|-----------------------|-------------|-------------|--------|
| Limitation in Movement | Yes n=42 (38.88%) | 14 (100%) | 28 (29.79%) | 0.0001 |
| | No n=66 (61.12%) | 0 (0.00%) | 66 (70.21%) | |
| Diabetes Mellitus | Yes n=21 (19.44%) | 8 (57.14%) | 13 (13.83%) | 0.03 |
| | No n=87 (80.56%) | 6 (42.86%) | 81 (86.17%) | |
| Chronic Kidney Disease | Yes n=14 (12.96%) | 6 (42.86%) | 8 (8.52%) | 0.04 |
| | No n=94 (87.04%) | 8 (57.14%) | 86 (91.48%) | |
| Obesity | Yes n=25 (23.14%) | 12 (85.72%) | 13 (13.83%) | 0.001 |
| | No n=83 (76.86%) | 2 (14.28%) | 81 (86.17%) | |
| Hx of Hypertension | Yes n=48 (44.45%) | 10 (71.42%) | 38 (40.42%) | 0.002 |
| | No n=60 (55.55%) | 4 (28.58%) | 56 (59.58%) | |
| Hx of Stroke | Yes n= 12 (11.11%) | 7 (50.00%) | 5 (5.32%) | 0.04 |
| | No n=96 (88.89%) | 7 (50.00%) | 89 (94.68%) | |
| Hx of Heart Disease | Yes n=18 (16.66%) | 9 (64.28%) | 9 (9.58%) | 0.04 |
| | No n=90 (83.34%) | 5 (35.72%) | 85 (90.42%) | |

Hx= History of

DISCUSSION

Bed sore is one of the major health problems in health care systems especially among the hospital admitted chronic patients. Bed sore is localized injury to an area of skin and related underlying tissues and it is mostly present over bony prominences of the body. The most common sites of the bed sores, are sacral, calcaneal, ears, and trochanteric.^{10,11} Once it develops in the patients, it could lead to pain, infection, sepsis, disability, and even in few severe cases, it could lead to death even.² Likewise, it adds burden over the restricted resources of hospitals of developing countries like Pakistan. This study has shown that incidence of BS was 12.96% among the study population. Almost similar rate of BS prevalence (12.70%) has been noted in Brazil.¹² However, in Palestine, lower prevalence was reported (7.30%).⁸ The higher incidence in this study population than population of Palestine might be due to the lower education about the bed sores among our study population.

It was found many factors associated with BS incidence and these included, age group, educational status, socioeconomic status, awareness about bed sores, hospital stay length, limitation in movement, diabetes mellitus, chronic kidney disease, obesity, history of hypertension, history of stroke, and history of heart disease, and these factors influence the incidence of the bed sores among hospital admitted patients significantly. About the impact of gender on incidence of BS, we noted that, BS incidence was not affected significantly by gender. We observed that bed sores incidence was higher among the patients who had advanced age, lower educational status, lower socioeconomic status, lower awareness about bed sores, longer hospital stay, limitation in movement, diabetes mellitus, obesity, history of hypertension, and history of heart disease in contrast to patients who had young age, higher educational status, higher socioeconomic status, higher awareness about bed sores, shorter hospital stay, no limitation in movement, no diabetes mellitus, no obesity, no history of hypertension, and no history of heart disease. Regarding chronic kidney disease, influence on BS incidence we found that, incidence of bed sores was higher among those chronic patients who had no chronic kidney disease than the patients those had chronic kidney disease. Likewise, chronic patients with and without stroke history had same rate of bed sores.

On literature review to compare this study results with the findings of other researches. Many researches were found to have results similar to the results of current study. Identical role of demographic factors like advanced age, lower educational status, lower socioeconomic status and lower awareness about BS, had noted in different studies that were conducted in different parts of the world.^{2,6,7,8,9} Regarding the impact the gender over BS incidence, we found no significance between difference two genders in BS incidence, however, in a study that was conducted at Iran, reported conflicting results and in this research, difference of BS incidence was significant.¹³

Likewise, in literature, the impact of other included potential factors like hospital stay length, limitation in movement, diabetes mellitus, obesity, history of hypertension, history of stroke, and history of heart disease, on BS incidence, was same in different studies that were conducted in various locations of the world, and these researches supported our study results.^{1,2,6,8,12,13} Among the patients of chronic kidney disease, we found that BS incidence was lower than chronic patients who had no chronic kidney disease. This finding might be due to better awareness about BS, no limitation in movement or due to presence of other protective factors among factors included patients of chronic kidney disease.

The knowledge of these elements is vital among the both overall public and specialists who make policies of wellbeing framework. A multidisciplinary group should establish an arrangement for the avoidance of controllable variables that lead to Bed sores. Since development of BS among patients not just bring monetary weight over chronic patients and but also bring physical disability and mental stress among chronic patients, which further more aggravate the circumstance. Subsequently, by applying reasonable interventions for the counteraction of preventable elements, we could lessen BS frequency and issues related with it among chronic hospitalized patients.

LIMITATIONS

Despite the fact, current study has provided crucial information about BS incidence and risk factors, it has also some limitations. Two major limitations included small sample size of study and this study included only patients who got admission in medical ward, because of these limitations we might have missed some potential risk factors of bed sores. Therefore, further researches are required to with large sample size and patients of different department to explore the potential risk factors more broadly.

CONCLUSION

This study shows significantly high incidence of bed sores among the study population. It shows that bed sores incidence was higher among the patients who had advanced age, lower educational status, lower socioeconomic status, lower awareness about bed sores, a longer hospital stay, limitation in movement, diabetes mellitus, obesity, history of hypertension, and history of heart disease, and these were associated with bed sores significantly. Regarding the chronic kidney disease, incidence of bedsores was higher among patients who had no chronic kidney disease, whereas, among patients who had stroke history and who had no stroke history, the incidence of bed sores was same. Furthermore, the incidence of bed sores was not dependent of gender of patients. Now, by modifying the modifiable factors we could reduce or prevent the bed sores among hospital admitted patient. Consequently, the reduction in bed sores incidence would lead to reduction over the economic and social lives of patients.

RECOMMENDATIONS

1. Make patients and their attendants aware about the risk factors of BS.
2. Patients should change their positions periodically.
3. Obese patients should reduce their weight.
4. All patients should take care of their skin, whereas, diabetic patients should take special care, as they are predisposed to skin infection more often.
5. Attendants of patients with chronic diseases should help patients in changing position time to time.

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