

Original Article

Prevalence of Bedsores Among Elderly Hospitalized in Imam Reza Hospital in Kermanshah: A Cross-sectional Study

Kamran Vafaei¹, Hooman Ghasemi², Mohammad Javad VeisiMiankali³, Nader Rajabi⁴, Maryam Chalechaleh¹, Milad Veisi¹, Niloufar Darvishi^{1,5*}

¹Clinical Research Development Center, Imam Reza Hospital, Kermanshah University of Medical Sciences, Kermanshah, Iran

²Student Research Committee, Kermanshah University of Medical Sciences, Kermanshah, Iran

³Nursing Department, Nursing and Midwifery School, Kermanshah University of Medical Sciences, Kermanshah, Iran

⁴Social Development and Health Promotion Research Center, School of Public Health, Kermanshah University of Medical Sciences, Kermanshah, Iran

⁵Department of Psychiatric Nursing, Tehran Medical Branch, Islamic Azad University, Tehran, Iran

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*Corresponding author:

Niloufar Darvishi,
Email: darvishi.niloufar@gmail.com



Abstract

Introduction: Pressure ulcer is one of the serious complications of patients, especially the elderly during hospitalization, which increases the cost of health care and decreases the quality of life of the patient, and often results from long stay in the hospital. Therefore, this study was conducted with the aim of determining the prevalence of bedsores among elderly hospitalized in Imam Reza hospital in Kermanshah.

Methods: This cross-sectional study was conducted on 5698 patients referred to Imam Reza hospital between 2019 and 2022. The inclusion criteria were more than 65 years old. Wound assessment was performed based on Braden criteria and wound grading by trained experts. After entering the SPSS version 16 software, the data were analyzed using a chi-square test.

Results: The average age of the participants in the study was 77.02 ± 8.27 years, and the highest frequency of bedsores (22.3%) was reported in the age group of 65 to 69 years. Wound grades 1 and 4 had the highest and lowest frequency respectively. The chi-square test analysis showed that the degree of wound and the risk assessment of pressure ulcers were not significant according to gender ($P < 0.05$).

Conclusion: According to the results of this study, the prevalence of bedsores in Imam Reza hospital in Kermanshah is high, therefore, health and medical units can play an important role in preventing bedsores by knowing about the at-risk populations and implementing appropriate preventive strategies.

Keywords: Aged, Pressure ulcer, Cross-sectional studies, Iran

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Introduction

In people with a normal sense, of mobility, and mental state, prolonged pressure triggers a feedback response that changes the body's posture. However, when the feedback response is absent or disrupted, sustained pressure eventually leads to tissue ischemia, injury, and necrosis. Pressure ulcers usually begin when a person's body weight exerts a downward force on the skin and tissue. Inserts a subcutaneous between the bony bump and the outer surface, such as a mattress or wheelchair cushion. Continuous pressure from medical devices may also cause pressure ulcers (1,2).

Global attention to pressure ulcers has increased, but they remain an important source of morbidity and mortality

and continue to pose a significant burden to patients and the healthcare system (3). ulcers account for an average of 19% of all hospitalized patients and the prevalence in the American orthopedic wards is 10.9% (4). Another meta-analysis study conducted in Europe stated that the overall prevalence of pressure ulcers reported in European studies was 10.8%, according to The highest prevalence of pressure ulcers reported in the Netherlands (27.2%) and Finland (5). The study of Karimian et al in Iran meta-analysis indicated that the prevalence of pressure ulcers in Iran was 19%. Also, the prevalence of pressure ulcers in grade 1, grade 2, and grade 3 were 38%, 41%, and 9%, respectively. The prevalence of bedsores in Iran's sacrum (54%) Bedsores were reported in brain injury (25%),



motor impairment (19%), and coma (46%) (4).

Several factors play a role in the development of pressure ulcers. Researchers have proven that pressure ulcer is caused by factors related to the individual and environment force (6). Another type of dividing the causes of bedsores is dividing factors based on internal or external factors. Internal factors are related to the patient's medical condition and external factors depend on the patient's environment. Internal risk factors are neurological disease, motor disorder, cognitive impairment, sensory loss, malnutrition, and hypo perfusion secondary to peripheral vascular disease or congestive heart failure. External risk factors such as motor bi-function, trauma, drug relief, poor posture (especially in patients with prolonged lack of consciousness), moisture, and tensile forces (7).

Pressure ulcer is one of the serious complications of patients during hospitalization that increases the cost of health care reduces the quality of life of the patient and is often the result of a long stay. Statistics show that each pressure ulcer, in addition to causing pain, increases the length of hospital stay for at least four days and increases the risk of nosocomial infection by 25% (8). The prevention of pressure ulcers is much more important than its treatment due to the challenges and high cost of treatment. The cornerstones of effective prevention strategies include appropriate support levels, frequent relocation, proper nutrition, and moisture management. Implementing prevention strategies often requires higher initial costs, but evidence has shown that this approach reduces costs compared to standard care alternatives (9,10). If the wound has already been established, in addition to all preventive care measures, appropriate wound care, non-surgical treatment, and surgical management should be used if necessary (11).

The prevalence of bedsores in the elderly is higher than others. Especially the elderly with chronic and freckled diseases (Frailty) are more prone to bedsores. This knowledge shows the necessity of preventive and therapeutic measures for the elderly (12). According to the results of the international study pressure ulcer prevalence (International Pressure Ulcer Prevalence Survey) in hospitalized patients was reported between 8 and 14%; and the incidence of bedsores in these patients was between 3% to 5% were reported (13). Therefore, the results of this study regarding the prevalence of bedsores in hospitalized elderly help us to plan for this goal.

Materials and Methods

Research Population and Sampling

This retrospective cross-sectional study was conducted in Imam Reza hospital, a Referral hospital in Kermanshah, west of Iran. In this study, the records of patients suffering from pressure ulcers between 2019 and 2022 were examined. Pre-determined forms were used to report bedsores. The bedsore report form was designed by professors and researchers and provided to different departments of the hospital. Wounds expert of Imam Reza hospital examines

the hospital wards daily. Pre-designed forms such as the age and gender of patients and their inpatient wards were extracted. Also, Braden score, wound stage, and wound site were extracted. Also, patients who were admitted to the hospital with ulcers were differentiated from patients who had ulcers in the hospital.

Pressure Ulcer Risk Assessment Criteria

The Braden scale is a standard tool for predicting pressure ulcer risk. Braden's score for each individual was calculated based on the total scores obtained from the sensory perception variables of moisture, activity, mobility, feeding, friction, and shear. Each of these factors was rated from 1 (worst case) to 3 or 4 (best case) according to the patient's condition. Therefore, the minimum score can be 6 and maximum 23 (14). Score higher than 18 indicates a risk-free status for pressure ulcer 15-18 low risk, 12-14 moderate risk, 9-12 high risk, and less than 9 indicates a severe risk.

Bedsore Grading

First-degree bedsores are the most superficial and mild stage and affect the upper layer of the skin. At this stage, the wound has not yet opened and the affected area is without superficial laceration. Grade II bedsore is opened in the painful area of the patient's skin, from the upper layer (epidermis) to the lower layer (dermis). Grade III bedsores are completely split into the upper two layers of the skin and reach the underlying fatty tissue. Grade IV pressure sore is the most serious stage. This subcutaneous wound extends to deep tissues, including muscles, tendons, and ligaments. Ungradable bedsores cannot be determined by their degree due to being covered with the underlying tissues. Bedsores necrosis are of this type.

Another category of bedsores suspected of deep tissue injury ulcers that develop in the deep tissue beneath the skin and are difficult to tell the depth. The surface of the skin looks like a first- or second-degree wound in this lesion. But this type of skin injury can quickly develop into a third- or fourth-degree bedsore. The appearance of this area may be discolored as skin. It is either purple or brown or in the form of a blood-filled blister.

Pressure Ulcers Associated With Medical Equipment

Wounds related to the use of medical devices are areas, where local damage to the skin or underlying tissue is caused by continuous pressure from medical devices, devices related to auxiliary devices (brace, neck collar, plastering, and splinting), anti-embolic devices (anti-embolic socks), intermittent pneumatic compression devices, various catheters (arterial catheter, hemodialysis, and extracorporeal catheters), membrane oxygen catheterization, inhibitions, oxygen supply devices (oxygen masks, nasal cannula, and tracheostomy tube), and patient monitoring devices (electrocardiograms and pulse oximeter probes) (15,16).

Common Sites of Bedsore

Common sites of bedsores were selected based on valid references. Posterior head, scapula, elbow, sacrum, ischial tuberosity, and heel are among the most common sites of pressure ulcers. Also, the lateral malleolus, large trochanter, shoulder, and ear are other high-risk areas for pressure ulcers. The occurrence of pressure fractures in the sacrum, ischial tuberosity, heel, lateral malleolus, and large trochanter are more common than in other affected areas.

Data Analysis

The descriptive analysis compared the incidence of bedsores in the elderly based on basic demographic characteristics, then we used the Pearson's chi-square test to analyze the differences between male and female genders.

Results

The total number of samples was equal to 5698 patients with bedsores referred to Imam Reza hospital between 2019 and 2022. The average age of the participants in the study was 77.02 ± 8.27 years, and the highest frequency of bedsores (22.3%) was reported in the age group of 65 to 69 years. Out of all recorded cases of bedsores, 38% were women. The analysis of risk assessment showed that only 3.6% of elderly people were diagnosed without risk and wound grades 1 and 4 had the highest and lowest frequency respectively. 87.2% of the cases with ulcers were hospitalized (Table 1).

The highest number of recorded cases were in the ICU, general ward, and surgery ward with 1631, 1320, and 904 cases, respectively. Wound analysis in tissue showed that the most recorded cases were Sacrum (Table 2).

The analysis of the chi-square test showed that the degree of wound and the risk assessment of pressure ulcers were not significant in terms of sex ($P < 0.05$). Also, analysis between sex and time of bedsores showed that the recorded cases of bedsores were higher in men who were admitted to the hospital with bedsores (Table 3).

Discussion

Bedsore is a common and serious condition that requires recognition, diagnosis, prevention, and treatment. The associated medical complications and costs can be significant (17). The study found that 38% of the reported cases of bedsores were among women, while the remaining cases were among men. However, there was no significant difference in wound grade and pressure ulcer risk assessment between genders. Men who were hospitalized with bedsores were more likely to reside in the hospital area. The sacrum tissue was the most commonly affected area. The highest frequency of bedsores was in the ICU, followed by general and surgical wards. The study also found that grades 1 and 4 had the highest and lowest frequency of bedsores, respectively. Some studies have suggested that gender may be a predictor of the likelihood of bedsores (18). Lardenoye et al also noted the role of

gender in bedsores in 2009 (19).

It can be said that high muscle mass in men increases the tolerance of tissues against various factors that contribute to the formation of bedsore (20). The age group with bedsores was 65-69 years old in the study of Karimian et al (4) and the highest prevalence of bedsores was in the age group of 60-70 years, which was almost similar to our findings. In the study, Akbari Sari et al increased age had a significant effect on the development of bedsores, so that 50% of reported bedsores occurred in patients over 60 years old. In studies, one of the risk factors for systemic bedsores is aging, followed by factors such as decreased mobility, reduced tissue tolerance, decreased skin vessels, and decreased pain perception in elderly people (5,18,21). In a review study conducted by Karimian et al (4), the most common site of hospitalized wounds was sacrum which is in line with our study (21).

The most common place of pressure ulcers especially in the supine position with 30%-49%, and then heels with 19%-36% of ulcers occur in the pelvic area and bedsores are rarely common in other area (22). In the study Akbari Sari et al (23), the prevalence of bedsores in the intensive care unit was 21%, which is higher in Akbari Sari et al

Table 1. Descriptive Statistics of Age and Gender Variables in Bedsore Cases in the Elderly (N=5698)

Variables	No.	%
Age (y)	65-69	1272
	70-74	1249
	75-79	1030
	80-84	908
	85-89	761
	90-99	478
Gender	Male	2163
	Female	3535
Pressure ulcer assessment risk	Very high (less than 9)	978
	High (10-12)	2464
	Medium risk (13-14)	1052
	The need for preventive interventions (15-18)	999
	Without risk (19-23)	205
	Class 1	2724
Wound degree	Class 2	2148
	Class 3	319
	Class 4	53
	No data	454
Bedsore time	Admit with wounds	4575
	Bedsore in hospital	672
	No data	451
	Necrosis	437
Tissue loss	Deep tissue damage	0
	No data	5261
Time of scarring and tissue loss	Admit with wounds	376
	Bedsore in hospital	66
	No data	5256

Table 2. Descriptive Statistics of Inpatient Wards and Location of Tissue Loss in Bedsore Cases

Variables	No.	%
Inpatient wards		
Intensive care	1631	28.6
Neurology	274	4.8
Emergency	338	5.9
Internal	1320	23.2
Urology	298	5.2
Surgery	904	15.9
Kidney transplantation	12	0.2
COVID-19	209	3.7
Cardiac intensive care	336	5.9
Oncology	54	0.9
Nerve surgery	262	4.6
Infectious	60	1.1
Total	5698	100
Location of tissue loss		
Behind of head	8	1.8
Shoulder to right.	13	2.9
The shoulder is on the left.	9	2
Left ischial tuberosity	2	0.5
Right heel	17	3.8
Left heel	18	4.1
Right lateral malleolus	12	2.7
Left lateral malleolus	16	3.6
Right elbow	4	0.9
Left elbow	1	0.2
Great right trochanter	17	3.8
Great left trochanter	26	5.9
Right shoulder	1	0.2
Left shoulder	2	0.5
Right ear	6	1.4
Left ear	6	1.4
Right buttocks	58	13.1
Left buttocks	50	11.3
Related equipment	8	1.8
Sacrum	126	28.5
Foot	9	6.6
Other	3	3
Spine	10	10
Total	442	100

study (24). In studies, the rate of bedsores in Iran has been reported 19% (4). Intensive care unit has the highest rate of adverse events due to unstable clinical patients and also the multiplicity of interventions (25), the prevalence of intensive care units and general surgery was relatively higher than in other wards (26). In another study, the reason for bedsores in the intensive care unit is due to the low safety of hospitalized patients in this ward (25). The highest and lowest frequency of bedsores in the present study was related to grades 1 and 4, which was followed by the findings of studies in Portugal (27) Ireland (28) Belgium (29) and Iran (4, 30) is similar.

Conclusion

The results of this study indicate a high prevalence of bedsores in Imam Reza hospital in Kermanshah. As such, health and therapeutic units should be aware of the at-risk populations and implement appropriate preventive strategies to help prevent bedsores. Based on the findings of this study, it appears that the incidence of bedsores at Imam Reza hospital in Kermanshah is quite high. As a result, healthcare and therapeutic facilities must identify populations that are at risk and implement effective preventative strategies to combat this issue.

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Authors' Contribution

Data curation: Maryam Chale Chale, Milad Veisy.

Formal analysis: Nader Rajabi.

Investigation: Mohammad Javad Veisy Miankali, Hooman Ghasemi

Methodology: Hooman Ghasemi.

Project administration: Kamran Vafaei.

Software: Nader Rajabi.

Supervision: Kamran Vafaei.

Writing original draft: Niloufar Darvishi.

Writing – review & editing: Niloufar Darvishi.

Competing Interests

None to declare.

Ethical Approval

This study was approved by the Research Ethics Committee of

Table 3. Comparison of the wound degree, pressure ulcer risk assessment, and bedsore in terms of gender

Variables		Female No. (%)	Male No. (%)	P Value
Wound degree	Class 1	1052 (52.2)	1673 (51.3)	0.203
	Class 2	787 (39.6)	1361 (41.8)	
	Class 3	133 (6.7)	186 (5.7)	
	Class 4	16 (0.8)	37 (1.1)	
Pressure ulcer risk Assessment	Very high (less than 9)	402 (18.6)	576 (16.3)	0.232
	High (10-12)	911 (42.1)	1553 (43.9)	
	Medium risk (13-14)	400 (18.5)	652 (18.4)	
	The need for preventive interventions (15-18)	370 (17.1)	629 (17.8)	
	Without risk (19-23)	80 (3.7)	125 (3.5)	
Bedsore time	Admit with wounds	1704 (85.6)	2871 (88.2)	0.006
	Bedsore in hospital	287 (13.03)	385 (11.8)	

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