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EVALUATING THE EFFECT OF TWO-HOURLY REPOSITIONING ON PRESSURE ULCER PREVALENCE: A CROSS-SECTIONAL STUDY AMONG HOSPITALIZED PATIENTS IN TERTIARY CARE HOSPITAL LAHORE

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Abstract

Background:
Pressure ulcers remain a major healthcare challenge, especially among bedridden patients in critical care settings. They increase morbidity, length of hospital stay, and healthcare costs. Two-hourly repositioning is one of the most cost-effective and evidence-based nursing interventions for preventing pressure ulcers, yet compliance remains inconsistent in many hospitals.

Aim:
This study aimed to evaluate the effect of two-hourly repositioning on the prevalence of pressure ulcers among hospitalized patients in a tertiary care hospital in Lahore.

Methods:
A cross-sectional analytical study was conducted in the intensive, high-dependency, and coronary care units of Jinnah Hospital, Lahore. A total of 175 bedridden patients were selected using convenience sampling. Data were collected through structured questionnaires, including demographic profiles, the Braden Scale, a pressure ulcer assessment checklist, and a repositioning adherence form. Data were analyzed using SPSS version 27, applying descriptive and inferential statistics.

Results:
The prevalence of pressure ulcers was 32%, with the sacrum and heels being the most affected areas. Most ulcers were in early stages (Stage I and II). Patients repositioned every two hours had significantly fewer ulcers than those repositioned less frequently ($p < 0.001$). Staffing shortages, lack of standard protocols, and poor documentation were identified as major barriers to compliance.

Conclusion:
Two-hourly repositioning effectively reduced pressure ulcer prevalence and improved patient comfort. Strengthening preventive protocols, staff training, and monitoring practices is essential for sustainable pressure ulcer prevention.

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INTRODUCTION

Pressure ulcers, also known as bedsores or decubitus ulcers, are localized injuries to the skin and underlying tissue caused by prolonged pressure, usually over bony prominences. Repositioning is a preventive nursing measure that involves moving patients at regular intervals to relieve pressure. (Gefen et al., 2022). The two-hourly repositioning technique requires patients to be turned every two hours to prevent sustained compression on one area. It is a fundamental nursing practice aimed at maintaining skin integrity and circulation. Pressure ulcers are a major concern in patient care due to their preventable nature. (Langemo et al., 2022).

Pressure ulcers are a prevalent issue in many patients in hospital and those who are immobile, and have a large impact on health care and patient quality of life. They can cause pain, infection, delayed wound healing and even sepsis and death. Treatment often involves complex medical interventions, extended hospitalizations and higher healthcare expenditures (Hernández-Martínez-Esparza et al., 2021). Pressure ulcers are also used as a quality measure of nursing care. Care for these preventable complications is costly and unethical for organizations. As such, preventive measures using evidence-based approaches are crucial in nursing care. Repositioning every two hours is a commonly known and accepted preventive measure (Langemo et al., 2022).

Pressure, friction, shear and moisture are the major risk factors for pressure ulcer. This causes reduced blood flow and oxygen supply, resulting in ischemia and tissue death (Gefen, 2024). Risk factors include limited mobility, paralysis and severe illness. The sacrum, heels, and elbows are common locations in bedridden patients. Prevention involves minimizing pressure time and enhancing blood flow. Repositioning, pressure relieving equipment and skin inspection are important aspects of prevention (Noreen et al., 2025). Regular prevention measures can prevent ulcers in vulnerable groups.

Repositioning is a key aspect of pressure ulcer prevention in nursing. Repositioning relieves pressure, enhances circulation and preserves skin integrity. While there is no one standard practice, two-hourly repositioning is commonly used in clinical practice. This helps prevent the occurrence of ischemic tissue damage in bedridden patients, and it requires high compliance and nursing engagement (World Health Organization, 2025). Further benefits include improving comfort and avoiding musculoskeletal issues. It is an easy and inexpensive technique that can be used in both high- and low-resource settings.

Unfortunately, repositioning is not always performed in many institutions. Non-adherence is linked with factors like workload, inadequate staffing and supervision. Nurses find it difficult to adhere to the two-hour schedule because of other clinical tasks (Iblasi et al., 2021). Lack of knowledge and documentation also contribute to low compliance with this preventive strategy. In certain cases, repositioning is not carried out regularly but intermittently, which increases the risk of pressure ulcers. Accountability and ongoing monitoring is required to enhance adherence (Almutairi et al., 2025; Gefen et al., 2022).

Pressure ulcer prevalence globally depends on the quality of care and patient factors. Research estimates the prevalence to be between 5% and 20% in acute care, and higher in long-term care (Anthony et al., 2021). In developed nations, prevalence is lower due to the use of prevention protocols, while in developing nations it is higher due to a lack of resources and standardized procedures. This reflects differences in staffing, training and resources. Prevalence is crucial for tracking institutional performance and enhancing patient safety (Poldrugovac et al., 2021).

In Pakistan, pressure ulcers are poorly recognized, yet the prevalence is rising in tertiary hospitals. Few hospitals have prevention programs and ongoing nursing education. Lack of guidelines and low staffing ratios limit effectiveness of repositioning (Noreen et al., 2025). Inadequate documentation and monitoring lead to poor outcomes and missed opportunities for early intervention. To prevent

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pressure ulcers, these obstacles need to be overcome.

Pressure ulcer treatment is more costly than prevention. Complex wound management, surgery, and prolonged hospitalizations drive up costs (Nancy et al., 2022). On the other hand, two-hourly repositioning is an affordable prevention strategy that saves money and optimizes resources. Preventive measures lead to improved results and cost savings in hospitals. Nursing staff awareness of the economic advantages of prevention improves accountability and compliance.

Two-hourly repositioning is an effective strategy for preventing pressure ulcers. This includes regularly changing the patient's position - from lying on their back to their side and stomach. Regularity and documentation are key to its effectiveness (Langemo et al., 2022). Skin checks allow for early identification of at-risk areas for intervention. Appropriate positioning also enhances patient comfort and compliance. Routinising this practice enhances the discipline of nursing and prevention (Avsar et al., 2021).

Nurses are key to repositioning measures. Their assessment, observation and protocol adherence are vital in success. Education improves nurses' implementation of evidence-based strategies (Peterson et al., 2025). Ongoing surveillance and collaboration enhance compliance with repositioning. Managerial support for optimal staffing and resources is essential. Audits and education initiatives also enhance accountability and adherence (Iblasi et al., 2021).

There is strong evidence for the relationship between repositioning and fewer pressure ulcers. Regular repositioning reduces the risk of ulcer formation, even in those at higher risk. But there are differences in repositioning frequency and practices among health-care facilities (Langemo et al., 2022). Some researchers promote a tailored repositioning frequency based on risk, but two-hourly repositioning is still widely used. The need for more research on repositioning frequency across different settings is clear.

This study will examine the impact of two-hourly repositioning on pressure ulcers in inpatients. The results will offer evidence of the impact of this intervention and inform nursing education and practice. The research will also inform policy to improve patient safety and quality of care. Overall, the findings will add to national and international evidence on strategies to prevent pressure ulcers, and support nursing practice in health care (Gefen et al., 2022).

The implications of this study will be very important in the healthcare policy and management. They will assist administrators in coming up with institutional guidelines that will facilitate frequent repositioning practices. The generated evidence will support the prevention and patient safety-oriented training programs. The adoption of good repositioning policies will improve the quality of nursing care. The enhanced compliance will help reduce the prevalence of pressure ulcers and improved patient outcomes. The research will promote the use of evidence-based nursing interventions in the long-term. These activities will eventually enhance healthcare quality, efficiency, and satisfaction among clinical patients.

Method

This study employed a cross-sectional analytical design to examine the association between two-hourly repositioning and the prevalence of pressure ulcers among hospitalized patients. It was conducted in the Intensive Care Unit (ICU), High Dependency Unit (HDU), and Coronary Care Unit (CCU) of Jinnah Hospital Lahore, a tertiary care facility representing diverse critical care settings. The study population included bedridden adult patients admitted for at least 48 hours. A total sample of 175 participants was selected using a convenience sampling technique based on eligibility criteria, including age ≥18 years and informed consent. Patients with pre-existing pressure ulcers, those able to reposition independently, and terminally ill patients with contraindications to repositioning were excluded.

Data Collection Procedure

Data were collected using structured instruments, including a demographic and clinical questionnaire, the Braden Scale for pressure ulcer risk assessment, a pressure ulcer assessment checklist, a repositioning adherence checklist, and

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a nursing documentation audit form. All tools were translated into the local language where necessary and pretested on 20 patients to ensure clarity and reliability. Data collectors received standardized training, particularly in Braden scoring and ulcer staging, to maintain inter-rater reliability. After obtaining informed consent, each participant was assessed for Braden score, skin condition, and presence of pressure ulcers. Repositioning practices were observed and verified through nursing records. Any identified pressure ulcers were staged, documented in detail, and photographed with consent for accurate recording.

Data Analysis Procedure

Data were analyzed using SPSS version 27. Descriptive statistics were used to summarize demographic and clinical variables in the form of frequencies, percentages, means, and standard deviations. Pressure ulcer prevalence was calculated as the proportion of affected patients in the total sample. Inferential analysis included the Chi-square test to examine associations between categorical variables and the independent t-test for continuous variables. Logistic regression analysis was performed to identify independent predictors of pressure ulcer development, with results reported as adjusted odds ratios (AORs) and 95% confidence intervals (CIs). A p-value of less than 0.05 was considered statistically significant for all analyses.

Results

Demographic Analysis

Table 4.1 presents the demographic data of 175 hospitalized patients. The majority (35.4%) were aged between 31–50 years, while 12% were above 70 years. Males comprised 54.9% of the participants. Most patients stayed between 6–10 days (39.4%) in hospital. Stroke (31.4%) was the leading diagnosis among admitted patients. Diabetes (38.3%) and hypertension (34.9%) were the most common comorbid conditions.

Table 1: Demographic Characteristics of Participants (n = 175)

Variable	Category	Frequency (n)	Percentage (%)
Age (years)	18–30	34	19.4
	31–50	62	35.4
	51–70	58	33.1
	>70	21	12.0
Gender	Male	96	54.9
	Female	79	45.1
Length of Hospital Stay (days)	2–5 days	52	29.7
	6–10 days	69	39.4
	>10 days	54	30.9
Primary Diagnosis	Stroke	55	31.4
	Fracture/Trauma	43	24.6
	Respiratory Disease	39	22.3
	Sepsis/Other	38	21.7
Comorbidities	Diabetes	67	38.3
	Hypertension	61	34.9
	Stroke	24	13.7
	Other	23	13.1

Table 2 shows that 40% of patients were completely bedridden, while 33.1% required assistance for movement. Nearly half (47.4%) were at risk of poor nutrition, and 22.9% were malnourished. Incontinence was reported in 53.7% of patients, with urinary incontinence being most common. About 36.6% used foam mattresses, whereas 34.3% had no pressure-relieving surfaces, indicating limited preventive resources.

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Table 2: Clinical Profile of Participants (n = 175)

Variable	Category	Frequency (n)	Percentage (%)
Mobility Status	Partial mobility	47	26.9
	Requires assistance	58	33.1
	Bedridden	70	40.0
Nutritional Status	Adequate	52	29.7
	At risk	83	47.4
	Malnourished	40	22.9
Presence of Incontinence	Urinary	48	27.4
	Fecal	19	10.9
	Both	27	15.4
	None	81	46.3
Use of Pressure-Relieving Surfaces	Foam mattress	64	36.6
	Air mattress	51	29.1
	None	60	34.3

Table 3 reveals that pressure ulcers were present in 32% of patients. The sacral region was the most affected (51.8%), followed by heels (25%). Most ulcers were in early stages, with Stage I (39.3%) and Stage II (33.9%) predominating. Only 8.9% developed Stage IV ulcers. Over half of the ulcers appeared within the first five days of hospital stay, showing early onset and need for vigilant prevention.

Table 3: Pressure Ulcer Assessment (n = 175)

Variable	Category	Frequency (n)	Percentage (%)
Presence of Pressure Ulcer	Yes	56	32.0
	No	119	68.0
Location of Ulcer	Sacrum	29	51.8
	Heels	14	25.0
	Hips	9	16.1
	Other	4	7.1
Stage (NPUAP/EPUAP)	Stage I	22	39.3
	Stage II	19	33.9
	Stage III	10	17.9
	Stage IV	5	8.9
Date of Onset	Within 5 days of admission	36	64.3
	After 5 days of admission	20	35.7

Table 4 shows that only 41.7% of patients were repositioned every two hours. Repositioning was mainly performed by nurses (52.6%), though caregivers contributed in 21.7% of cases. Major barriers included staffing shortages (42.3%) and lack of written protocols (23.4%). Documentation practices were suboptimal, with 44.6% maintaining regular records and 22.8% showing no documentation at all. These results reflect gaps in adherence to nursing preventive standards.

Table 4: Repositioning Practices (n = 175)

Variable	Category	Frequency (n)	Percentage (%)
Frequency of Repositioning (Last 24 hrs)	Every 2 hours	73	41.7
	Every 3–4 hours	49	28.0

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	Once daily	28	16.0
	Not repositioned	25	14.3
Who Performed Repositioning	Nurses	92	52.6
	Caregivers	38	21.7
	Patient self	19	10.9
	Not done	26	14.8
Barriers to Repositioning	Staffing shortage	74	42.3
	Patient refusal	33	18.9
	Lack of protocol	41	23.4
	High workload	27	15.4
Documentation of Repositioning	Regular	78	44.6
	Incomplete	57	32.6
	Absent	40	22.8

Figure 1: Repositioning Practices of Patients

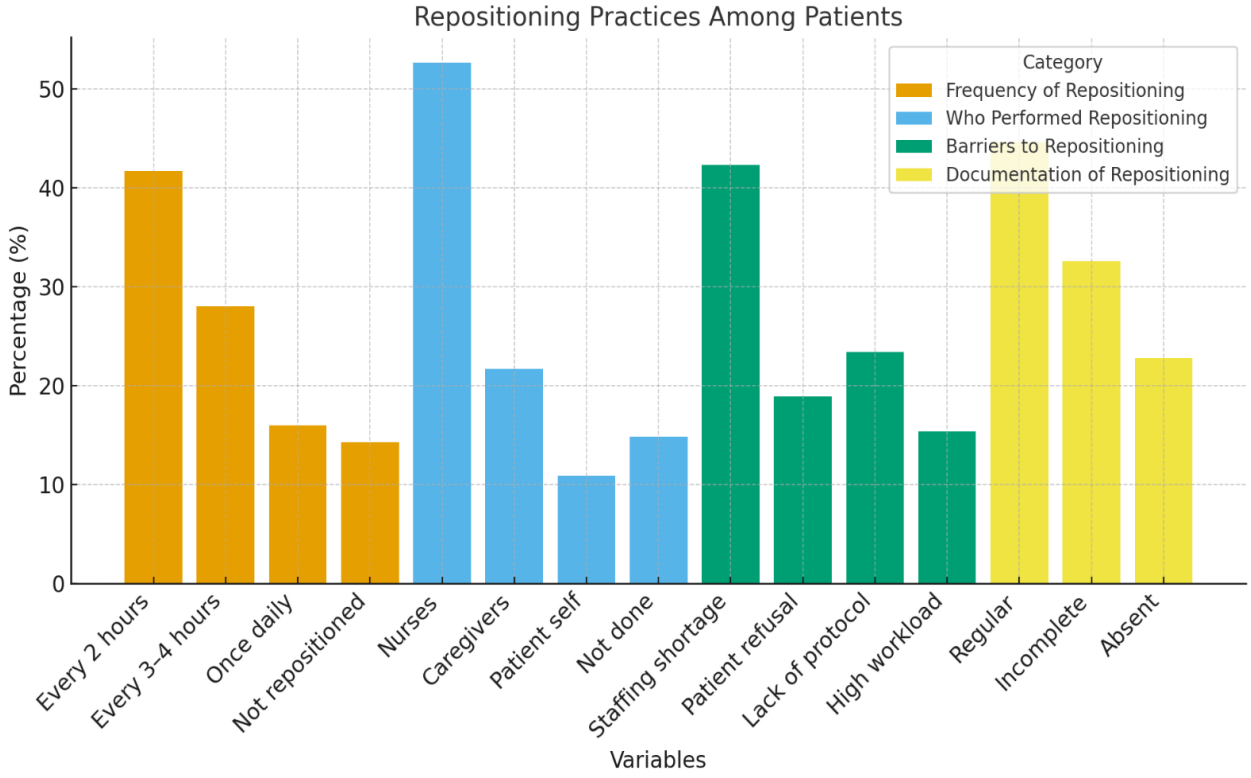

Table 5 indicates that 61.7% of patients had a repositioning schedule implemented, yet only 41.7% received consistent two-hourly repositioning. Patient comfort improved in 64% of cases following repositioning, showing its clinical benefit. However, 58.3% of patients did not adhere to the recommended interval, reflecting a gap between planned and actual care. The findings emphasize the importance of monitoring adherence to evidence-based repositioning protocols.

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Table 5: Nursing Adherence and Observation (n = 175)

Variable	Category	Frequency (n)	Percentage (%)
Repositioning Schedule Implemented	Yes	108	61.7
	No	67	38.3
Two-Hourly Repositioning Maintained	Yes	73	41.7
	No	102	58.3
Patient Comfort After Repositioning	Improved	112	64.0
	No change	50	28.6
	Worsened	13	7.4

Table 6 demonstrates a significant association between repositioning frequency and the occurrence of pressure ulcers (p = 0.001). Patients repositioned every two hours showed the lowest ulcer rate (12.3%), compared to 58% among those not repositioned or repositioned once daily. The results confirm that regular two-hourly repositioning effectively reduces pressure ulcer development. This supports the intervention's preventive role and aligns with international nursing guidelines.

Table 6: Association Between Repositioning Frequency and Pressure Ulcer Occurrence (n = 175)

Frequency of Repositioning	Pressure Ulcer Present	Pressure Ulcer Absent	χ^2	p-value
Every 2 hours	9 (12.3%)	64 (87.7%)	18.74	0.001*
Every 3–4 hours	18 (36.7%)	31 (63.3%)		
Once daily or not repositioned	29 (58.0%)	21 (42.0%)		

Discussion

This study assessed the effect of two-hourly repositioning on the prevalence of pressure ulcers in patients of tertiary care hospitals. The results showed that 32% of the respondents experienced pressure ulcers, most commonly over the sacral area. This is higher than the worldwide prevalence, which generally ranges from 5% to 20% (VanGilder et al., 2021), reflecting the need for improvement in preventive strategies in our local health care. This high rate might be due to lack of compliance to repositioning policies and minimal utilization of pressure-relieving devices in tertiary hospitals in Pakistan.

The age range of patients in this study was 31-70 years, with 54.9% men. This is in line with other studies that report middle-aged and older adults are more vulnerable because of their decreased mobility and reduced blood flow to tissues (Cox et al., 2022). But the presence of younger participants indicates that immobility and other diseases, rather than age, play a significant role (Peterson et al., 2025).

The patients in this study were often found to have conditions such as diabetes and hypertension, which have been identified as risk factors for pressure ulcers. This finding is in line with studies that demonstrate the link between chronic illness, impaired circulation and delayed healing (Gefen, 2024). This study highlights the need for nurses to consider and manage these comorbidities in their prevention strategies.

Nutritional status was also a high risk factor with almost half of the patients at risk of malnutrition. This is backed up by the research of Nancy et al. (2022), where they noted that patients at nutritional risk have impaired skin integrity and delayed healing. Research has also demonstrated the effectiveness of nutritional support programs in decreasing ulcer incidence, suggesting repositioning needs to be coupled with nutritional support (Avsar et al., 2021).

Sacrum (51.8%) and heels (25%) were the most frequent anatomical locations of pressure ulcers in this study. This finding is in line with other studies that report these sites as susceptible to pressure ulcers due to sustained pressure and lack of cushioning (Chien & Tsai, 2024). These areas suggest that repositioning and pressure-relieving devices in high-risk areas need to be considered.

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The majority of pressure ulcers in our study were at Stage I and Stage II, suggesting early stages of development. This could indicate some prevention strategies are being used, but not consistently. This is consistent with the findings in settings that follow preventive guidelines in part (Källman et al., 2022). By contrast, critical care settings have higher rates of severe ulcers due to a lack of frequent repositioning (Cox et al., 2022).

Patients were repositioned every two hours as per guidelines in only 41.7% of cases in this study. This rate is consistent with the low rates found in Pakistan hospitals by Shah et al. (2025) attributed to staffing and workload pressures. By contrast, other studies have found higher levels of compliance with established prevention programs and resources (Alrwaili et al., 2024). This indicates variations in system support and staff training in different health systems.

Lack of staff and absence of repositioning guidelines were the most frequent barriers identified. These results are in line with Iblasi et al. (2021), who highlighted that the lack of leadership and administrative support impairs adherence to preventive practices. This study supports the need for organizational support and staff empowerment to promote evidence-based nursing practice.

The current study also found a significant association between frequency of repositioning and pressure ulcers ($p = 0.001$). A lower incidence of ulcers was observed among patients repositioned every two hours, in contrast to those repositioned every four hours. This result is consistent with other studies that have shown frequent repositioning minimises ulcer incidence and enhances patient outcomes (Asiri, 2023). Repositioning has been found to be a cost-effective and effective prevention technique (Peterson et al., 2025).

Repositioning also resulted in improved comfort for patients (64% felt it was therapeutic). This is consistent with the findings of Gefen (2024), who reported that repositioning improves blood circulation and decreases discomfort. Furthermore, patient-centered care, incorporating comfort measures, has been reported to enhance compliance with preventive measures (Alrwaili et al., 2024).

The present study contrasts with studies showing high compliance rates, emphasizing the continued need for improvement in resource-limited settings. This includes lack of training, supervision and motivation of nurses. Similar issues exist in South Asian settings (Shah et al., 2025), highlighting the need for education reinforcement and support.

Documentation of repositioning practices was absent in over half the cases, mirroring findings by Chen et al. (2024), which found incomplete documentation leads to poor accountability and continuity of care. Institutions with electronic documentation have improved compliance and surveillance (Chen et al., 2024). This indicates that improved documentation has the potential to improve prevention efforts.

This research offers insight in Pakistan, where there is a lack of literature on repositioning effectiveness in tertiary hospitals. This study's results are consistent with other studies that highlight the need for well-organised prevention programs and ongoing staff education to lower the prevalence of pressure ulcers (Peterson et al., 2025). By contrast, lower prevalence rates are reported in healthcare systems in developed countries, as a result of ongoing monitoring and policy enforcement (VanGilder et al., 2021).

In summary, this study's findings align with international research that repositioning patients every two hours is a cost-effective and evidence-based approach to pressure ulcer prevention. But there are numerous barriers in its application, especially in low-resource settings. In line with global evidence, prevention is not solely reliant on nursing practices, but is supported by institutional support, staff education and enforcement of policies (Iblasi et al., 2021; Alrwaili et al., 2024). Improving these aspects in tertiary care hospitals of Pakistan can prevent pressure ulcers and enhance nursing care.

Conclusion

The researchers concluded that two-hourly repositioning is an effective and evidence-based and low-cost nursing intervention that prevents pressure ulcers in patients admitted to hospitals. The results showed that the patients whose repositioning was frequent had a much lower rate

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of pressure ulcers than those whose repositioning was not, which is a clear indication of the importance of regular preventive measures. Most ulcers were located in the sacral and heel areas, and the most prevalent were at the early stages of ulcers, which means that the preventive measures were partially followed, but not consistently. The following were some of the major barriers identified: poor staffing, no standardized practices concerning the repositioning, and poor documentation practices. The research demonstrated that regular training, effective supervision, and institutional support are critical in ensuring compliance of repositioning. The findings in general indicate that following the two-hourly repositioning schedules have the potential to significantly decrease the rates of pressure ulcers, increase patient comfort, and in general, the quality of nursing care in tertiary hospital in Lahore.

Recommendation

Resting on the results of the conducted study, it is possible to suggest the following recommendations that will help to prevent pressure ulcers and improve the quality of nursing care:

1. **Introduction of Standardized Protocols:** Hospitals are supposed to create and initiate standardized two hourly repositioning protocols throughout all wards though especially in critical care units.
2. Nursing Education and Training: The continuous professional development programs are to be structured in a way that nurses are trained on the prevention of pressure ulcers, Braden scale assessment, and the staging of the ulcers.
3. **Sufficient Staffing:** Hospital administrations are advised to maintain optimum nurse-patient ratios to administer repositioning and holistic care to the patients in time.
4. **Frequent Auditing and Observation:** The audit of the repositioning practices should be regularly monitored and audited to assess the adherence and find out the improvement opportunities.
5. **Application of Pressure-Relieving Devices:** Adequate pressure-relieving mattresses, cushions and other support devices should be provided with a view to reducing the development of ulcers.
6. **Enhance Documentation Practices:** Implementation of electronic or standardized documentation systems to enhance accuracy and accountability in documentation of repositioning activities done.
7. **Patient and Family Education**: Patients and family members should be informed on the benefits of repositioning and made to be involved in preventive treatment.
8. **Policy and Administrative Support:** The hospital leadership ought to incorporate pressure ulcer prevention in institutional policies and invest in preventive programs in order to maintain them.
9. **Future Research:** Future researchers need to investigate the long term effects of repositioning interventions and its effectiveness in comparison with other preventive measures in different health care environments.

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