DOI: 10.53469/jcmp.2026.08(01).27

Retrospective Analysis and Quality Improvement Research of 25 Nursing Adverse Events

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Abstract: ***Objective: To analyze the occurrence characteristics and causes of nursing adverse events in the whole hospital from April 1, 2025 to June 30, 2025, formulate targeted rectification measures, and improve the quality of nursing safety management. Methods: A retrospective analysis method was adopted to statistically analyze 25 nursing adverse events reported by 18 clinical departments in the whole hospital from April to June 2025, and a systematic analysis was carried out from the dimensions of event type, department distribution, grading, occurrence time and causes. Results: Falls/falls from bed accounted for the highest proportion (40.00%, 10 cases), followed by unplanned extubation (16.00%, 4 cases), other events (12.00%, 3 cases), drug-related events (8.00%, 2 cases), and scald events (8.00%, 2 cases). Blood transfusion events, accidental injury events, and medication error events each accounted for 1 case (4.00% respectively). The Geriatrics Department had the highest incidence rate (12.00%, 3 cases). The event grading was mainly Grade III (56.00%, 14 cases), followed by Grade II (24.00%, 6 cases) and Grade IV (20.00%, 5 cases). Falls/falls from bed mainly occurred from 22:00 to 8:00 the next day (80.00%), and the patients were mainly elderly people over 65 years old (90.00%). Conclusion: Falls/falls from bed are core risk events, and their causes involve multiple factors including patients, diseases, nurses, caregivers and the environment. It is necessary to construct a closed-loop quality improvement system through comprehensive measures such as strengthening dynamic risk assessment, standardizing nursing operations, optimizing health education, improving environmental facilities and strengthening caregiver management, so as to ensure the safety of patient care.***

Keywords: Nursing adverse events, Falls/falls from bed, Cause analysis, Quality improvement, Patient safety.

1. Introduction

Nursing safety is a core pillar of the medical quality system and a key link in achieving the World Health Organization's goal of "Zero Harm to Patients". The occurrence of nursing adverse events is by no means an isolated problem. It not only directly interferes with the patient's treatment process, but may also lead to disease recurrence and adjustment of treatment plans, and significantly prolong the length of hospital stay. This not only increases the economic burden and care pressure on patient families, but also occupies limited medical resources. More seriously, adverse events are likely to trigger a crisis of trust between doctors and patients and induce medical disputes. If not handled properly, it will cause irreparable damage to the professional reputation and social credibility accumulated by the hospital over a long period of time [1-2]. At present, China's population aging process is accelerating continuously, and the proportion of elderly people aged 65 and above is rising. Elderly patients generally have problems of physical function degradation, such as decreased balance ability, weakened muscle strength, and delayed sensory perception, which greatly increase the nursing risk. At the same time, the disease spectrum is becoming increasingly complex, and the phenomenon of comorbid chronic diseases (such as hypertension combined with diabetes, cerebral infarction with osteoporosis, etc.) is becoming more common. Patients' treatment plans involve multiple types of drugs and various operations, which further increases the complexity and uncertainty of nursing work. These changes have made the risk factors in nursing work spread from single to multiple, putting forward higher requirements for the refinement, dynamism and professionalism of nursing safety management [3-4]. To actively respond to the above challenges, in accordance with the "Nursing (Safety) Adverse Events and Hidden Danger Information Reporting" system issued by the National Health Commission, the Nursing Quality and Safety Management Committee of Inner Mongolia Forestry General Hospital carried out a systematic summary and analysis of nursing adverse events in 18 clinical departments (including key departments such as CCU, NICU, Geriatrics Department, and Orthopedics Department) of the whole hospital from April 1 to June 30, 2025 (the second quarter), with "data-driven safety improvement" as the core. This analysis is not a simple statistical count, but an in-depth analysis covering multiple dimensions such as event type, department distribution, grading, occurrence time, and patient characteristics. It aims to accurately identify the occurrence rules and core causes of adverse events, provide a solid data support for formulating scientific and targeted rectification measures, and then lay a practical foundation for continuously optimizing nursing processes, improving nursing quality, and reducing the incidence of adverse events, ultimately realizing the all-round protection of patient care safety.

2. Materials and Methods

2.1 Data Source

A total of 25 nursing adverse events actively reported by 18 clinical departments in the whole hospital (including CCU, NICU, Otorhinolaryngology Department, Orthopedics Department, Respiratory and Critical Care Medicine Department, etc.) from April 1, 2025 to June 30, 2025 were selected. All events were verified and confirmed by the Nursing Quality and Safety Management Committee, with complete and traceable information.

2.2 Research Methods

A retrospective analysis method was adopted. Referring to the classification standards of nursing adverse events, the events were divided into 9 categories: falls/falls from bed, unplanned extubation, drug-related events, scalds, patient dissatisfaction,

blood transfusion, accidental injury, medication errors, and other events. According to the "Grading Standards for Nursing Adverse Events" [5], they were classified as follows: Grade 0: The event was stopped before execution. Grade I: The event occurred and was executed, but no harm was caused. Grade II: Minor harm, no change in vital signs, requiring clinical observation and minor treatment. Grade III: Moderate harm, partial changes in vital signs, requiring further clinical observation and simple treatment. Grade IV: Severe harm, significant changes in vital signs, requiring an increase in nursing level and emergency treatment. Grade V: Permanent functional loss. Grade VI: Death. A database was established using Excel to count information such as event type, occurrence department, grading, time distribution, and patient characteristics. Descriptive statistical analysis was used to explore the occurrence rules of events, and the causes were analyzed in depth combined with individual cases.

2.3 Judgment Standards

- Falls/falls from bed events: Patients accidentally fell or fell from bed during hospitalization, resulting in injuries such as skin abrasions, hematomas, fractures, or no obvious injuries;
- Unplanned extubation events: Patients voluntarily or due to improper nursing caused the detachment of drainage tubes, endotracheal intubation and other pipelines before meeting the expected extubation indicators;
- Drug-related events: Including nursing errors related to drugs such as phlebitis caused by drug infusion, drug confusion, and delayed medication administration;
- Other events: Including adverse events not included in the above classifications such as patients leaving without permission, getting lost, and incorrect use of blood collection tubes.

3. Results

3.1 Overall Situation of Nursing Adverse Events

A total of 25 nursing adverse events occurred in the whole hospital from April 1 to June 30, 2025, an increase of 9 cases compared with the first quarter of 2025 (16 cases), with a growth rate of 56.25%. The events covered 18 clinical departments, including 6 Grade II events (24.00%), 14 Grade III events (56.00%), and 5 Grade IV events (20.00%).

3.2 Type Distribution of Nursing Adverse Events

Falls/falls from bed accounted for the highest proportion (40.00%) with 10 cases, including 8 falls and 2 falls from bed; 4 cases of unplanned extubation (16.00%), including 2 cases of abdominal drainage tube detachment, 1 case of lumbar cistern drainage tube detachment, and 1 case of endotracheal intubation detachment; 3 cases of other events (12.00%), including 1 case of patient leaving without permission, 1 case of getting lost, and 1 case of incorrect use of blood collection tubes; 2 cases each of drug-related events and scald events (8.00% respectively); 1 case each of blood transfusion events, accidental injury events, and medication error events (4.00% respectively). See Table 1 for specific distribution.

Table 1: Type Distribution of Nursing Adverse Events from April 1 to June 30, 2025

Event Type	Number of Cases	Composition Ratio (%)
Falls/falls from bed events	10	40.00
Unplanned extubation events	4	16.00
Other events	3	12.00
Drug-related events	2	8.00
Scald events	2	8.00
Patient dissatisfaction events	1	4.00
Blood transfusion events	1	4.00
Accidental injury events	1	4.00
Medication error events	1	4.00
Total	25	100.00

3.3 Department Distribution of Nursing Adverse Events

3 cases (12.00%) occurred in the Geriatrics Department, which was the department with the highest incidence rate; 2 cases each (8.00% respectively) occurred in CCU, Interventional Therapy Department, Rehabilitation Medicine Department, Neurology Department I, and Hematology and Oncology Department; 1 case each (4.00% respectively) occurred in NICU, Otorhinolaryngology Department, Orthopedics Department, Respiratory and Critical Care Medicine Department, Intravenous Drug Dispensing Center, Endocrinology Department, General Surgery Department III, General Practice Department, Neurology Department II, Neurosurgery Department, Ophthalmology Department, and Outpatient Office.

3.4 Detailed Characteristics of Falls/falls from Bed Events

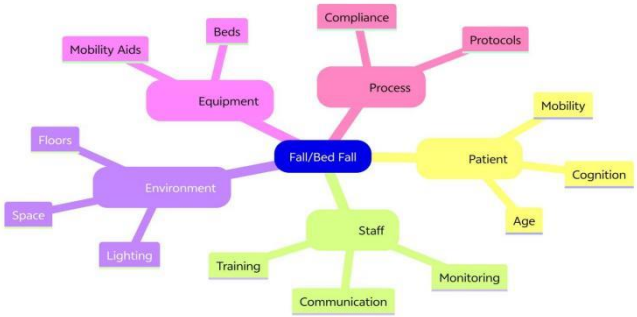
- Patient age: 56-91 years old, of which 9 cases (90.00%) were over 65 years old, and the high-incidence age group was 72-91 years old;
- Consciousness state: 9 patients were conscious (90.00%), and 1 patient was in sleep state (10.00%);
- Risk score: 1 case (10.00%) with 1-5 points (low risk), 8 cases (80.00%) with 6-13 points (medium risk), and 1 outpatient case (10.00%);
- Occurrence time: 8 cases (80.00%) from 22:00 to 8:00 the next day, 1 case (10.00%) from 12:00 to 14:00, and 1 case (10.00%) from 15:00 to 17:00;
- Event consequences: 1 case of left femoral neck fracture, 1 case of femoral trochanteric fracture, 1 case of subcutaneous hematoma with wound on the right head, and no serious harm in the other 7 cases.

4. Discussion

4.1 Analysis of Core Causes of Nursing Adverse Events

4.1.1 Falls/falls from Bed Events: High Risk Caused by Multiple Factors

As the core adverse event type accounting for 40.00% (10 cases) in this quarter, the causes of falls/falls from bed are not due to a single factor, but the superposition of risks in five dimensions: patients, diseases, nurses, caregivers, and the environment, and each dimension has specific traceable risk points. From the patient's perspective, advanced age is the core inducement - 9 out of 10 cases were patients over 65 years old, of which more than 70% were aged 72-91 years old. This group not only has problems such as decreased balance ability (standing on one leg with eyes closed for less than 5 seconds), weakened lower limb muscle strength (muscle strength is mostly grade 3-4), and osteoporosis (prone to fractures after falling), but also often accompanied by visual (decreased night dark adaptation ability) and hearing loss, making it difficult to detect ground obstacles in dim light at night. More importantly, some patients have deviations in self-assessment. For example, an 82-year-old patient in the recovery period of cerebral infarction overestimated his own mobility because he could walk independently slowly daily, refused the caregiver's night care, and slipped due to dizziness caused by orthostatic hypotension when getting up to go to the toilet at 3 a.m., resulting in subcutaneous hematoma on the right head. The disease and drug aspects further increase the risk. 8 out of 10 patients had comorbid underlying diseases such as cerebral infarction, hypertension, and diabetes: cerebral infarction led to unilateral limb muscle strength dropping below grade 3, causing the patient to shift their center of gravity when walking; peripheral neuropathy caused by diabetes made the patient's foot tactile sense dull, making it difficult to detect even when stepping on a slippery floor; antihypertensive drugs (such as nifedipine) may induce orthostatic hypotension, diuretics (such as furosemide) increase the frequency of getting up at night, and hypnotic drugs (such as estazolam) cause morning confusion. The superposition of the three greatly increases the risk of falls in patients during high-risk periods (22:00 to 8:00 the next day) [6]. The management omissions at the nurse's level cannot be ignored. Some nurses have insufficient intervention for low and medium-risk patients. For example, a patient with a risk score of 6 points (medium risk) had reduced activity due to pain on the third day after surgery, and muscle strength dropped from grade 4 to grade 3, but the nursing assessment form was not updated in a timely manner, and the management was still carried out according to the original plan; health education was mostly verbal, and no graphic manuals or warning videos on fall prevention were distributed to family members, resulting in insufficient understanding of the requirement of "full-time night care" by family members [7]. In addition, the period from 22:00 to 8:00 the next day is a weak period for nurses on duty. If other patients have emergency situations such as infusion reactions, it is easy to neglect the rounds of high-risk patients. There was a case where a patient fell when getting out of bed because the nurse missed the rounds once an hour while dealing with hypoglycemia of a neighboring patient. The cognitive and operational defects at the caregiver's level also need to be paid attention to. Most caregivers are family members of patients. After undertaking care tasks during the day, they often fall asleep lying on the bedside due to fatigue at night, and do not respond when the patient calls for help when getting up at night; some non-professional caregivers (such as temporary caregivers) lack correct assistance skills, only pulling the patient's upper limbs when helping them, without supporting the waist and lower limbs, leading to imbalance of the patient's center of gravity when getting up; some caregivers ignore the nurse's reminder to "place slippers in a fixed position beside the bed" and randomly place shoes in the passage, increasing the risk of tripping when the patient gets out of bed. Environmental hazards provide objective conditions for falls. The width of the passage in some wards is only 0.8 meters due to additional beds, and patients are prone to colliding with the bed edge when passing with crutches; the induction of voice-controlled lights in the bathroom is delayed, and patients need to wait 2-3 seconds for the lights to turn on after entering, and the short period of darkness at night is likely to cause blurred vision; the old bed rails in 3 wards can only bear less than 80kg, and the bed rails are prone to shaking when patients grasp them for support when getting up; wards without independent bathrooms require patients to walk 15 meters to the public bathroom. On the way, if they encounter cleaning carts occupying the road, they are prone to imbalance when detouring; no special personnel are assigned to take charge of the escalators in the outpatient department. There was a case where a 75-year-old patient fell to the bottom of the escalator because he did not step firmly due to the deviation in perceiving the height of the steps and no one helped him when taking the escalator.



4.1.2 Unplanned Extubation Events: Insufficient Risk Assessment and Operational Standardization

The occurrence of unplanned extubation events is closely related to patients, nurses, pipelines and treatment factors [8]. Patients have weak self-protection awareness due to cachexia and advanced age, and restlessness, pain or foreign body sensation trigger the urge to extubate; nurses fail to dynamically identify risks such as the patient's consciousness state and restlessness degree, the pipeline is not fixed firmly (not reinforced with abdominal belts or StatLock), the tightness of the restraint belt is improperly adjusted, health education fails to ensure that family members understand the purpose of restraint, and night rounds are not timely; the pipeline itself has problems such as insecure fixation and excessive exudation, increasing the risk of slipping; at the treatment level, effective sedation is not given early, and high abdominal pressure is not intervened in a timely manner [9].

4.1.3 Drug-related Events: Dual Defects in Technology and Management

The occurrence of drug-related events includes improper puncture technology of nursing staff, unreasonable selection of blood vessels, insufficient rounds, lack of knowledge about the characteristics of irritating drugs such as amiodarone and the prevention of phlebitis; patients' poor vascular conditions due to advanced age, edema and poor circulation, and insufficient awareness of adverse drug reactions; amiodarone injection is highly acidic (pH 2.5-4.0), exceeding the tolerance range of peripheral veins, and high infusion concentration is prone to causing phlebitis; environmental and tool factors such as low ward temperature and prolonged use of indwelling needles further increase the risk. At the same time, the classified management of drugs is not standardized, and no obvious signs are set up, leading to drug confusion.

4.1.4 Other Events: Supervision and Process Loopholes

Events such as patients leaving without permission and getting lost are mainly due to the patient's cognitive impairment or emotional problems, nurses failing to shorten the round interval for high-risk patients, failures of the access control system, and lax management of ward entry and exit; incorrect use of blood collection tubes results from nurses failing to strictly implement the two-person verification system, relying on verbal information transmission, and simplifying operation steps during the morning treatment peak period.

4.2 Nursing Quality Improvement Measures

4.2.1 Rectification for Falls/falls from Bed Events

Strengthen the risk awareness of elderly patients, carry out personalized education of "verbal + graphic + video" for low/medium-risk patients, and require patients and their families to repeat key measures and confirm mastery; strengthen communication between doctors and nurses, optimize the use plan of high-risk drugs, equip walkers for patients with muscle strength ≤ grade 3, and dynamically assess the status of postoperative and infected patients; standardize the risk assessment and handover process, increase the frequency of rounds during high-risk periods, and regularly carry out emergency plan drills; clarify the responsibilities of family caregivers, and require 1 family member to be at the bedside at night; standardize safety facilities, with the distance between hospital beds ≥ 1.2 meters, install voice-controlled lighting in the bathroom, test the bearing capacity of bed rails ≥ 100kg, equip mobile commodes for wards without independent bathrooms, assign special personnel to take charge of the escalators in the outpatient department and repair the access control system; invite the quality management team to intervene in departments with high fall rates, and establish a closed-loop management of "data-driven - precise intervention - effect verification - experience replication".

4.2.2 Rectification for Unplanned Extubation Events

Dynamically assess the risk of pipeline slipping for high-risk patients such as those with cachexia, advanced age and restlessness, and formulate personalized nursing plans; standardize the pipeline fixation process, use reinforcement tools such as StatLock and sutures, adopt unopenable restraint belts, and two-person verification of the tightness of restraint; adopt the three-step method of "education - feedback - confirmation" to guide family members to supervise caregivers in implementing key points of pipeline care, and emphasize that the release of restraint must be approved by doctors and nurses; strengthen special training and assessment for nurses, enhance collaboration between doctors and nurses, timely adjust sedation and analgesia plans and treatment measures, and intervene in high abdominal pressure early [10].

4.2.3 Rectification for Drug-related Events

Dynamically assess the vascular conditions and drug tolerance of elderly and edematous patients, and inform them of the symptoms of phlebitis and reporting procedures; standardize puncture operations, preferentially select thick, straight and elastic veins, change the puncture site every 2-4 hours for continuous infusion, use dual channels alternately, and strictly implement the flushing process; strengthen rounds and monitoring, inspect the puncture site every hour, and reduce reliance on infusion pumps; dilute the concentration of highly irritating drugs and preferentially select central venous access; strengthen drug knowledge training, add obvious signs for different departments in drug baskets and fix the storage area.

4.2.4 Rectification for Other Events

Strengthen the cognitive and psychological assessment of high-risk patients, provide psychological counseling, and strengthen the education on the registration system for going out and access control; strictly implement the graded nursing and two-person verification system, and shorten the round interval for high-risk patients; clarify the 24-hour care responsibilities of family members, repair faulty access control in a timely manner, and optimize the task allocation during the morning peak period; carry out training on risk prediction and emergency handling capabilities for nursing staff, and strengthen the sense of responsibility with individual cases as warnings.

4.3 Thoughts on Continuous Quality Improvement

The incidence of nursing adverse events in this quarter has shown an upward trend compared with the previous quarter and the same period of previous years, indicating that there are still weak links in nursing safety management. It is necessary to establish a closed-loop management mechanism of "active reporting - cause analysis - measure formulation - implementation tracking - effect evaluation", regularly carry out case discussions and warning education on adverse events, and improve nurses' risk prevention awareness and emergency handling capabilities; strengthen cross-departmental collaboration, cooperate with logistics departments to optimize ward environment and facilities, and cooperate with medical departments to improve the communication process between doctors and nurses; establish a special supervision mechanism for departments with high incidence rates and high-risk event types, regularly evaluate

the effect of rectification and dynamically adjust measures; at the same time, strengthen the safety participation awareness of patients and their families, and build a doctor-patient collaborative safety protection system [11].

5. Conclusion

The incidence of nursing adverse events in Inner Mongolia Forestry General Hospital showed a significant upward trend from April 1 to June 30, 2025. Falls/falls from bed were the main type of events, and their causes involved multiple aspects including patients, diseases, nurses, caregivers and the environment. The incidence of adverse events can be effectively reduced by implementing targeted rectification measures such as strengthening dynamic risk assessment, standardizing nursing operations, optimizing health education, improving environmental facilities and strengthening caregiver management. In the future, it is necessary to continuously deepen the closed-loop quality improvement system, strengthen the supervision of key links, high-risk groups and weak departments, continuously improve the level of nursing safety management, and effectively ensure the safety of patient care.

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