

Implementation of Nursing Admission System in the Neonatal Intensive Care Unit for Safety Management

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Abstract: Objective: To improve nursing quality and safety of Neonatal Intensive Care Unit (NICU). Methods: The nursing admission standard in NICU was applied. Systematic training was given to nurses entering NICU. Results: After application of the nursing Admission System of NICU, the incidence of adverse events was significantly reduced and patient satisfaction was significantly improved. Conclusion: Admission management system for NICU can effectively improve the quality of care and protect the safety of children.

Key words: NICU; Admission system; Nursing quality; Safety

Neonatal Intensive Care Unit (NICU) normally focuses on the treatment of critically ill neonatal. A good environment and quality medical care are important to improve the survival rate of newborns and future quality of life¹. Besides, high precision instruments, advanced treatment techniques and treatment are vital as NICU focuses on the critical condition of children with varying conditions. As a result, there are high risk factors during the nursing care. Some studies^{2, 3} reported that human factor is the most critical and controllable factor in nursing risk management. Therefore, the primary tasks of NICU care are improving the overall quality of nurses, the NICU job qualifications and the technical capacity requirements. Our hospital applied the nursing admission system in the NICU since May 2013 and achieved remarkable results.

1. Materials and methods

1.1 Participants

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A total of 23 nurses participated in this study, all females. Their age ranged from 20-47 years old, mean 34.2 years, includes 7 head nurses, 10 nurse practitioners and the rest are nurses. Thirteen of them are undergraduates, nine are specialists and one is secondary nursing. One of them are chief nurse and 3 nurses are responsible leaders.

1.2 Methods

1.2.1 Application of NICU nursing admission standards Job description in NICU was set up.

The NICU nurses must be engaged in the neonatal clinical work for more than 1 year. The NICU nurses can independently complete the clinical works. Besides, the nurses must complete series of training of the NICU nursing admission. The nursing quality is audited by the management committee. The qualified nurses were issued with the NICU nurse certificate by the Nursing Department.

1.2.2 Training

The training content includes etiology, pathophysiology, clinical manifestations, treatments and care measures of the common neonatal diseases. Besides, liquid preparation methods and precautions were trained. Neonatal resuscitation, emergency tracheal intubation, ventilator, rescue techniques and artificial airway management were trained. Performance, maintenance and use of a variety of equipment in the neonatal room were trained. The common neonatal nursing operations, observation and rescue measures of the emergency critical illness in children were trained. The control measures, disinfection and isolation are required for neonatal nosocomial infection. In addition, neonatal work process, safety education and self-management capacity are required. Detailed training plan was developed according to the level of nurses (N0, N1, N2 and N3).

1.2.3 Assessment

The assessment is divided into written examination, simulation operation and actual operation. Nurses are required to answering papers for the written examination. For the simulation and actual operation, assessment criteria and rules are set according to the project, assessment content, standard requirements, scores and other settings checklist. Individual examination score ≥ 90 is listed as qualified.

1.2.4 Certificate

After passing the assessment of training program, a written application was submitted to the hospital care quality management committee. The nursing department issued NICU nurse certificates. Re-training is required for any vacation more than 3 months.

1.2.5 Optimization of the scheduling model

Responsible leader was assigned for each class to implement responsibility nursing care. The quality and number of children in charge were determined according to the level of NICU nurses. The higher level nurses in charge of the relatively heavy condition children. The scheduling model was adjusted by the responsible leader according to specific circumstances.

1.2.6 Performance management

The nursing level is divided into 1.0, 1.1, 1.2, 1.3 and 1.4. The monthly salary depends on the nursing level and performance evaluation according to the number of patients in charge of, quality and attendance.

1.2.7 Statistical methods

SPSS17.0 software was used to perform X² test, test level $\alpha = 0.05$.

2. Results

2.1 Implementation of admission management

Table 1 shows the comparison of the NICU care adverse events before and after implementation of admission management.

Table 1 Adverse events occurred before and after the implementation of NICU care admission management

Project	Admitted patients	Adverse events					
		Liquid error	Wrist strap error	Pipeline slippage	Bed Falling	Skin damage	Incoming and outgoing errors
Before Admission	2785	4	2	16	2	7	4
After Admission	2904	1	0	3	0	1	0
X ²		1.9302	0.5392	9.4827	0.5392	4.7633	4.1739
P		0.1647	0.3768	0.0021	0.3768	0.0291	0.041

2.2 Satisfaction of patients

Table 2 shows pre-and post-admission satisfaction of patients.

Table 2 Comparison of patient satisfaction before and after admission

Project	Number of hospitalizations	Number of survey items	Satisfied	Dissatisfied	Satisfaction rate
Before Admission	343	6860	6657	203	97.04%
After Admission	379	7580	7505	75	99.01%
X ²					73.9959
P					0.0000

2.3 Comparison of dispute

A total of 6 cases of disputes occurred among the 343 hospitalized patients before application of the admission system with the incidence rate of 1.75%. After application of admission system, only one dispute case occurred among the 379 hospitalized patients with the incidence rate of 0.26%. Comparison before and after admission system shows X² = 4.1377, with significant difference (P = 0.0419).

3. Discussion

3.1 Implementation of NICU admission system improves the quality of care and safety

NICU is a full-time non-accompanying special ward. Nurses not only need to complete a large number of basic cares and technical operations every day, but also need to take care of living care with heavy workload. The conditions of newborns are full with changes, yet they do not have the expressive ability. Thus, judgment of the condition of newborn depends on careful observation and clinical experience of nurses. As the NICU practice shifts, the nurses have irregular rest time. Nurses need to maintain abundant energy and flexible response capabilities towards the condition changes, equipment operation and other emergency situations. Overall, implementation of admission system is vital in order to improve the quality and safety of NICU care and avoid security risks. Job requirements must match with the theoretical knowledge of a comprehensive, skilled operation, emergency communication and coordination capacity. More and more hospitals applied the admission system for the management of key positions.

3.2 Improve the overall quality of the NICU personnel

The overall quality of the NICU personnel is the core element to ensure the quality and safety of the NICU nurses. Nurses conducted all the nursing care⁴. Previous study² shows that the competencies and basic quality of nurses are the top two influential factors of nursing risk. NICU nurses are facing with the newborns without expressive ability. Therefore, care of the newborns requires careful observation and judgment to observe feelings, effective treatment, condition and prognosis of patients. As a result, improvement of overall quality of the NICU nurses plays a crucial role in improving the nursing care quality and safety. After the implementation of the admission system and effective training plan, the assessments showed improvement in observation and judgment, critical condition foresight, prevention ability, first-aid ability and handling of emergency situations. Besides, the implementation of admission system enhances the awareness of risk prevention and also legal awareness. Furthermore, the abilities in department management and self-management have been improved significantly. Communication and coordination of nurses were trained and improved. Cooperation between doctors and nurses was improved. Nursing adverse events were significantly reduced, while nursing quality and safety can be guaranteed.

3.3 Improve the NICU management system

A good management system is important in protecting the quality and safety in the NICU. Previous study⁵ reported that identification of potential risk factors and remediation can help to prevent clinical errors. A nursing quality management committee should be established during implementation of the admission system. Nursing risks can be detected timely through supervision and quality inspection. The incidence of adverse events can be effectively reduced through revision of systems, plans and other measures. The responsible leaders are in charge of allocation of the number of beds, supervision of nursing works, coordination of emergency matters, and deployment of human resources to ensure that work quality.

4. Conclusion

A nursing risk information management system should be established. Nursing staffs are encouraged to take the initiative to report the nursing risks to stimulate the participation of nurses in risk management and to create a safe environment⁶. At the same time, the nursing level management and performance appraisal should be incorporated into the NICU care quality management. Nurses will consciously involve in the nursing management to effectively prevent

nursing risks and protect the safety of children.

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