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The Role of Grid-Style Nursing Management Model in Critically Ill Patients

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Abstract: *Objective:* This study aims to gain insight into the effects and potential advantages of the grid-style nursing management model in the care of critically ill patients. *Methods:* Eighty critically ill patients admitted to our hospital between May 2020 and May 2021 were selected and randomly divided into the control group and the grid group, each with 40 patients. The control group implemented traditional nursing management, while the grid group adopted a grid-style nursing management model. The quality of care, quality of life, nursing satisfaction, and treatment adherence of the two groups were compared. *Results:* Compared with the control group, the grid group had significantly higher quality of care and quality of life ($P < 0.001$); in terms of nursing satisfaction, the score of the grid group was 8.26 ± 0.85, which was significantly higher than that of the control group (6.65 ± 0.77) ($P < 0.001$); 90.00% (36 patients) of the grid group showed good treatment adherence, significantly higher than 70.00% (28 patients) of the control group ($P < 0.001$). *Conclusion:* The implementation of the grid-style nursing management model in critically ill patients can significantly improve the quality of care, quality of life, and satisfaction of patients, and effectively promote patients' treatment adherence. These positive results provide strong support for the promotion and application of this model in clinical care.

Keywords: Grid-style; Nursing management model; Critical illnesses

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1. Introduction

The intensive care unit (ICU) is a specialized department in hospitals that focuses on the care of critically ill patients. These patients typically have severe and complex conditions that can change rapidly, resulting in a high mortality rate. This places extremely high demands on the nursing care provided in the ICU [1]. Traditional nursing models often struggle to effectively address challenges such as large patient volumes, severe conditions, and diverse care needs. As a result, they may fall short in ensuring the quality of care and patient safety [2]. In recent years, with the continuous development of medical and nursing concepts, a variety of new nursing models have come into being, among which the grid-style nursing management model, with its scientific, efficient, and flexible characteristics, has shown unique advantages in nursing and has received increasing attention and application. The grid-style nursing management model is a new patient-centered nursing model. Based on standardization

and normative management, the nursing unit is divided into several grids, with each assigned dedicated nurse responsible for care. This innovative nursing model emphasizes accountability and hierarchical management, ensuring that responsibility is clearly defined and assigned to specific individuals [3]. Its core is to improve the efficiency of nursing work, guarantee the quality of nursing care, and enhance the treatment success rate and patient prognosis by optimizing the allocation of nursing human resources, clarifying job responsibilities, and strengthening information communication and collaboration. At present, many studies at home and abroad have shown that the application of the grid-style nursing management model can effectively reduce the incidence of patient complications, shorten the length of hospitalization, improve patient satisfaction, and decrease the work pressure on nurses. However, most of the existing studies focus on a single disease or a specific group of patients and lack a systematic evaluation of the effectiveness of the application of the grid-style nursing management model in patients of different types and disease spectrums. Based on this, this study aims to explore the application effect of the grid-style nursing management model in patients with critical illnesses, to analyze its impact on patients' physiological indicators, psychological status, and quality of life, and to explore its impact on nursing work efficiency, nursing quality, and nurses' job satisfaction.

2. General information and methods

2.1. General information

In this study, 80 patients with critical illnesses who were admitted to our hospital between May 2020 and May 2021 were selected and divided into the control group and the grid group based on the principle of random grouping, with 40 patients in each group. Inclusion criteria: (1) Aged 18 years and above; (2) Diagnosed with critical illnesses, meeting the relevant criteria for critical illnesses; (3) Patients or their legal guardians signed the informed consent. Exclusion criteria: (1) Presence of serious comorbidities or multiple organ dysfunction; (2) Unstable psychological state, unable to cooperate with the nursing assessment; (3) Patients with previous nursing history affecting the evaluation of this study; (4) Patients who were transferred to another hospital or withdrew halfway during the study period.

2.2. Methods

2.2.1. Control group: Traditional nursing management model

Under the traditional nursing management model, the nursing care of patients with critical illnesses is as follows: (1) Primary nurse system: Each nurse was assigned a fixed number of patients and was responsible for their care throughout the entire process. This included initial admission assessments, developing and implementing care plans, administering treatments, monitoring changes in the patient's condition, and providing discharge guidance. The primary nurse handled all these tasks to ensure continuity and personalized care. (2) Hierarchical management: Nursing work was carried out in a three-tier management system: head nurse, nurse in charge, and primary nurse. The head nurse was responsible for the nursing management of the whole department, the nurse in charge was responsible for coordinating and supervising the work of the primary nurses, and the primary nurses carried out the nursing measures. (3) Experience orientation: Nurses mainly relied on personal experience and clinical guidelines to care for patients, lacking systematic assessment and quantitative indicators, making it difficult to ensure the stability and consistency of nursing quality. (4) Low efficiency of information transmission: Patient information was mainly transmitted through writing nursing records and verbal handover, which was prone to problems such as untimely, incomplete, and error-prone information.

2.2.2. Grid group: Grid-style nursing management model

The grid-style nursing management model is patient-centered, dividing the hospital into several grid areas, each of which is assigned primary nurses who are fully responsible for the care of all patients in the area from admission to discharge, building a patient-centered service model. Primary nurses serve as patients' "health caregivers," who not only pay attention to patients' illnesses but also their psychological state and social needs, and provide personalized and humanized nursing services. Specific processes are as follows: (1) Responsibility grid division: The department was divided into a number of grids, and each grid was assigned a primary nurse group, which had defined responsibilities for the care of all the patients in the grid, preventing the shirking of duties and enhancing the proactivity and accountability of nursing staff. (2) Division of labor: Within the responsibility nurse group, tasks are distributed according to each member's professional expertise and the specific needs of the patients. The primary nurse, nursing team leader, specialist nurse, and nursing assistants each fulfill their roles, working collaboratively to provide comprehensive, professional, and efficient care for the patients. (3) Standardized process: A standardized nursing process was formulated for different diseases and degrees of illnesses and was strictly implemented to ensure that every patient receives standardized and scientific nursing care, which effectively prevented differences in the quality of nursing care caused by human factors. (4) Information management: By establishing patients' electronic medical records as well as real-time recording and sharing of patients' information, the interconnection of nursing information was realized, improving the efficiency and accuracy of information transmission and providing more reliable data support for nursing decision-making.

2.3. Observation indicators

2.3.1. Quality of nursing care

Our hospital formulated assessment standards covering six aspects, including nursing instruments, basic care, technical operation, health education, sterilization and isolation, and implementation system. The scoring range for each aspect is 0–100 points, aiming to comprehensively assess the professional competence and service level of nursing staff in all aspects.

2.3.2. Quality of life

In this study, the widely recognized scoring system GQOLI-74 (Generic Quality of Life Inventory-74) was used to assess patients from four aspects, namely, material life, psychological function, physical function, and social function, with the total score for each aspect being 100 points. This aims to understand the overall life status and satisfaction of patients after receiving nursing care.

2.3.3. Nursing satisfaction

Patients' overall evaluation of nursing care was collected using the hospital's self-developed questionnaire in order to understand patients' experiences and expectations of nursing care services, thus promoting the continuous improvement of nursing care quality.

2.3.4. Treatment compliance

According to the actual treatment behavior of patients, they were classified into three grades: full adherence, partial adherence, and non-adherence, in order to assess the patients' implementation of medical advice.

2.4. Statistical methods

Statistical processing was performed with SPSS23.0. Measurement data were expressed with mean ± standard deviation (SD), while count data were expressed using [*n* (%)], the comparison between the groups used the two-sample *t*-test or χ^2 test. $P < 0.05$ indicated statistically significant differences.

3. Results

3.1. Comparison of quality-of-care scores

Compared with the control group, the quality-of-care scores (including nursing instruments, basic care, technical operation, health education, sterilization and isolation, and implementation system) of the grid group were significantly higher ($P < 0.001$), as shown in **Table 1**.

Table 1. Comparison of the quality-of-care scores of patients in the two groups (mean ± SD, points)

Groups	Nursing instruments	Basic care	Technical operation	Health education	Sterilization and isolation	Implementation system
Control group ($n = 40$)	82.67 ± 3.07	83.65 ± 3.77	81.97 ± 3.45	83.78 ± 3.87	85.31 ± 3.02	84.37 ± 3.66
Grid group ($n = 40$)	92.87 ± 4.12	93.26 ± 3.85	92.48 ± 3.67	95.34 ± 4.27	94.52 ± 4.01	93.68 ± 4.21
t	12.556	11.280	13.197	12.687	11.603	10.555
P	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001

3.2. Comparison of quality-of-life scores

Compared with the control group, the quality-of-life scores (material life, psychological function, physical function, and social function) were significantly better in the grid group ($P < 0.001$), as presented in **Table 2**.

Table 2. Comparison of quality-of-life scores between the two groups (mean ± SD, points)

Groups	Material life	Psychological function	Physical function	Social function
Control group ($n = 40$)	73.32 ± 1.47	70.89 ± 3.24	70.48 ± 4.21	71.15 ± 2.65
Grid group ($n = 40$)	82.56 ± 1.78	81.27 ± 3.04	80.41 ± 4.06	80.68 ± 2.45
t	25.314	14.776	10.738	6.701
P	< 0.001	< 0.001	< 0.001	< 0.001

3.3. Comparison of nursing satisfaction

The nursing satisfaction score of the patients in the grid group (8.26 ± 0.85) was significantly higher than that of the control group (6.65 ± 0.77) ($P < 0.001$), as shown in **Table 3**.

Table 3. Comparison of nursing satisfaction of patients in the two groups (mean ± SD, points)

Groups	Number of cases (*n*)	Nursing satisfaction score
Control group	40	6.65 ± 0.77
Grid group	40	8.26 ± 0.85
t	-	8.878
P	-	< 0.001

3.4. Comparison of treatment adherence

90.00% (36 patients) of the grid group showed good treatment adherence, which was significantly higher than 70.00% (28 patients) of the control group ($P < 0.001$), as presented in **Table 4**.

Table 4. Comparison of treatment adherence between the two groups [*n* (%)]

Groups	Full adherence	Partial adherence	Non-adherence	Treatment adherence
Control group ($n = 40$)	18 (45.00)	10 (25.00)	12 (30.00)	28 (70.00)
Grid group ($n = 40$)	25 (62.50)	11 (27.50)	4 (10.00)	36 (90.00)
χ^2	-	-	-	5.000
P	-	-	-	0.025

4. Discussion

There are several challenges in the traditional nursing management model, such as uneven distribution of nursing resources, unclear responsibilities, and poor information transfer, which make it difficult to meet the growing demand for medical care. In order to solve these problems, the grid-style nursing management model has emerged. As a novel nursing management model, the grid-style nursing management model effectively solves the issues of unclear responsibilities and uneven distribution of resources that existed in the traditional model by dividing the nursing work into different responsibility grids, clarifying the person-in-charge of each grid, and establishing a collaborative mechanism. At the same time, the grid-style nursing management model also focuses on process standardization and information construction. The development of standardized nursing processes and the construction of an information management platform ensure more standardized and efficient nursing work, achieving real-time sharing of information and effectively preventing poor information transmission.

This study suggests that compared with the traditional management model in the control group, the adoption of the grid-style management model can significantly improve the quality of care, patients' quality of life, and patient satisfaction with care. In addition, the grid-style management model can effectively improve patients' adherence to treatment. Grid-style management model can play a positive role in the care of patients with critical illnesses, mainly based on the following reasons: (1) Comprehensive coverage and clear responsibility: In the grid-style management model, the emergency department is divided into a number of grids, with each grid assigned a special nursing staff responsible for the patients, achieving a comprehensive coverage of the patient and nursing work. Compared with traditional line-style management, grid-style management puts responsibility into practice, preventing unclear and shirking of responsibilities and ensuring the timeliness and effectiveness of nursing work [4]. (2) Hierarchical management for improved efficiency: Grid-style management implements a three-tier management structure of "head nurse, nurse in charge, primary nurse," with clear responsibilities at each level and a smooth flow of information. This hierarchical management model is conducive to improving management efficiency, ensuring timely detection and resolution of nursing problems, and promoting the continuous improvement of nursing quality. (3) Strengthened communication and efficient collaboration: Grid-style management emphasizes teamwork and promotes information sharing and collaboration among nursing staff by establishing a sound communication mechanism. This efficient communication and collaboration mechanism can effectively prevent medical errors caused by untimely information transfer or poor communication and protect patient safety. (4) Enhanced skills and promotion of development: The grid-style management model focuses on the professional skills training of nursing staff,

and comprehensively improves their comprehensive quality by strengthening the training of operational skills, communication skills, and emergency response capabilities [5]. At the same time, grid-style management also provides nursing staff with more opportunities to participate in management and learning, stimulating their work enthusiasm and initiative, and promoting personal career development. (5) Enhancement of patient satisfaction: Under the grid-style management model, nursing staff are able to understand patients' needs in a more timely and comprehensive manner and provide more personalized and humanized nursing services [6]. This patient-centered nursing model effectively enhances patient satisfaction with care and builds a harmonious doctor-patient relationship.

5. Conclusion

In summary, the grid-style nursing management model plays an important role in caring for patients with critical illnesses. It not only improves the quality and efficiency of care but also enhances patient satisfaction and the professionalism of nursing staff. In the future, with the continuous improvement, promotion, and application of the grid-style management model, it is believed that it will play a greater role in enhancing the care of patients with critical illnesses.

Disclosure statement

The authors declare no conflict of interest.

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