DOI: 10.53469/jcmp.2026.08(01).29

# The Influence of the Construction of Intensive Care Core Team Based on PDCA Mode on the Quality of Patient Care

**Chunxuan Wei, Hongyun Ji, Yanfang Lu*, Chaoyan Xu, Xiaoling Lu**

Affiliated Hospital of Youjiang Medical University for Nationalities, Baise 533000, Guangxi, China
*Correspondence Author*

**Abstract:** ***Objective: To explore the effect of the construction of critical care core team based on PDCA model on the quality of patient care, in order to improve the quality of care by strengthening the construction of nurse team. Methods: A total of 116 patients who were hospitalized in the Department of Critical Care Medicine of the Affiliated Hospital of Youjiang Medical University for Nationalities from June 2024 to December 2024 were selected as the study subjects. The patients were divided into observation group and control group. The control group was treated with routine nursing mode. The management mode of intensive care core team construction based on PDCA mode in the observation group. By comparing the differences between the two groups of patients in the morning nursing quality, the incidence of complications and the nursing satisfaction of the patients' families after the construction of the nurse team, the improvement of the nursing effect of the construction of the core team of intensive care based on the PDCA model was evaluated. Results: After intervention, the scores of morning nursing quality and family satisfaction in the observation group were higher than those in the control group, and the incidence of complications was lower than that in the control group, the differences were statistically significant (P < 0.05). Conclusion: The construction of intensive care core team based on PDCA mode is helpful to improve the nursing quality of patients, reduce the incidence of complications and improve the satisfaction of patients' families, which has certain clinical promotion value.***

**Keywords:** PDCA mode, Core team, Quality of care, Team building.

## 1. Introduction

As one of the core indicators to evaluate the overall effectiveness of medical institutions, the importance of nursing quality has become increasingly prominent [1]. With the continuous innovation of medical technology and the increasing expectation of the public on the level of medical services, optimizing the quality of care in intensive care unit (ICU) has become a frontier research topic in the field of nursing management [2-4]. At present, the number and quality of ICU nurses in China are uneven, which leads to great differences in the quality of patient care [5]. In the document of "Five-year Plan for Nursing in China (2021-2025)," it is proposed that improving the quality of nursing services and continuously promoting high-quality development should be one of the important tasks for the development of nursing discipline [6]. Nursing staff plays a major role in the key links of patients' vital signs monitoring, dynamic assessment of disease and first aid cooperation. Therefore, the construction quality of the intensive care core team not only directly determines the quality of patient care services, but also profoundly affects the patient's life safety and rehabilitation progress. At present, the construction of ICU management core team in China still faces multiple challenges, and the empirical research on the effect of such team construction on the quality of patient care is still insufficient. The PDCA model, that is, the cycle process of planning - execution - examination - processing, is a systematic management method that has been widely used in the field of nursing management. Its main purpose is to optimize the overall management quality by implementing continuous quality improvement [7, 8]. Therefore, this study will build a core team of intensive care based on the PDCA model and apply it to clinical practice, aiming to explore the impact of this method on the quality of patient care.

## 2. Objects and Methods

### 2.1 Research Object

In this study, 116 patients admitted to the Affiliated Hospital of Youjiang Medical College for Nationalities from June 2024 to December 2024 were selected as the research objects. Inclusive indicators: 1) Patients' age ≥18 years old; 2) The estimated length of ICU stay ≥ 24 hours; 3) the patient is conscious or can be awakened, able to participate in or cooperate with care; 4) Patients or family members were aware of this study and agreed to participate. Exclusion criteria: 1) Consciousness state for patients with persistent coma; 2) Patients with expected survival time < 24 hours; 3) Patients or family members refused to participate in the study; 4) Patients with severe mental illness who are unable to cooperate with care. According to the order of admission time, the patients were divided into control group and observation group, 58 cases in each group. The control group adopted the routine nursing mode, and the observation group adopted the nursing mode of intensive care core team construction based on PDCA mode. In the control group, there were 32 males and 26 females, with an average age of (50.76 ± 8.95) years and an average APACHE II score of (19.74 ± 2.00) points. In the observation group, there were 30 males and 28 females, with an average age of (49.86 ± 9.35) years and an average APACHE II score of (19.95 ± 2.68) points. There was no significant difference in gender, age and APACHE II score between the two groups (P > 0.05).

### 2.2 Research Methods

2.2.1 Control group:

Routine nursing management method was adopted, PDCA

mode was not implemented, and nursing work was carried out according to routine process. According to the nursing quality standards and operation procedures, the nursing staff regularly checked and evaluated the quality of basic nursing, specialized nursing, infection control and patient safety by means of on-site inspection and medical records. The problems found in the examination were fed back and rectified in time, and the rectification effect was tracked to ensure the continuous improvement of nursing quality.

2.2.2 Observation group

PDCA mode was used to construct the core team of intensive care.

(1) Plan: Before the implementation, the ICU nursing core team was formed. The head nurse was the team leader, and 12 nurses with rich clinical experience, strong professional skills and communication and coordination ability were selected as the core members of the team. 1) Objective setting: To set the goal of improving the quality of care in the intensive care unit. There are three goals, which are to improve the quality of morning care for patients, reduce the incidence of adverse events and improve patient satisfaction. 2) Conduct problem analysis: The head nurse analyzes the common problems in the management of the department by checking the nursing records written by the bed nurses, the feedback of the team meeting and the opinions of the family members every day. 3) Make a plan: according to the existing problems, the PDCA model is used to formulate the corresponding implementation plan. Including the following: a. team training: according to the professional needs of team members and the actual situation, to develop personalized training programs. The training content covered the professional knowledge and operation skills of intensive care, the application of quality management tools, the improvement of communication efficiency and team cooperation mechanism. At the same time, organize team internal training regularly. b. Optimize the nursing workflow: To comprehensively sort out and optimize the current nursing process and simplify the operation steps. For common nursing operations, such as the use of ventilators, the use of electrocardiogram monitors, etc., detailed standard operating procedures were developed to ensure operating specifications. At the same time, reduce the use of paper documents and improve the efficiency of information sharing. Establish an efficient communication mechanism: Establish a team communication platform (such as WeChat group, QQ group), timely convey work information and tasks, and strengthen communication and exchange between members. Regular team meetings were held to summarize and analyze the nursing work and formulate improvement strategies. Strengthen communication with doctors, patients and their families, understand the needs and feedback of patients, in order to improve the quality of nursing services.

(2) Do: 1) Training implementation: Organize systematic training according to the established plan to ensure that team members are proficient in interdisciplinary collaboration skills and standardized nursing procedures. 2) Process execution: Strictly follow the standardized nursing process, including key links such as airway management, pressure ulcer prevention and medication verification. The responsible nurses recorded the implementation daily, and the team conducted regular quality checks. 3) Communication and collaboration: The daily morning meeting is chaired by the head nurse, and the members report the patient's condition and propose a nursing plan. Collective participation is implemented in bedside handover to ensure the accuracy of information transmission. 4) Recording and feedback: Nurses record the implementation of nursing work daily, including patients' vital signs, complications and teamwork. The head nurse summarized the data every week and fed back to the team to analyze the problems in the implementation process.

(3) Check: According to the established nursing quality standards and operating procedures, the team members regularly review the quality and evaluate the effect of ICU nursing practice. Through on-site verification, medical records review and other methods, basic nursing, specialist nursing, infection control and patient safety were examined. The problems found in the inspection were rectified, and the rectification effect was tracked to ensure the continuous optimization of nursing quality. Based on the results of data analysis, identify the links that do not meet the expected standards, hold team meetings every month, systematically summarize the problems, and discuss specific improvement strategies.

(4) Act: 1) In view of the problems identified in the inspection stage, formulate and implement corrective strategies. 2) The validated effective interventions were transformed into standardized operating procedures, which were promoted and applied in other departments. 3) According to the PDCA cycle theory, start a new round of improvement cycle. By re-evaluating nursing quality data, setting new improvement goals, and optimizing related processes, the continuous improvement of nursing quality can be achieved.

**2.3 Assessment Indicators**

2.3.1 Quality of patient care. The self-made ICU patients' morning nursing quality evaluation table was used for evaluation. The contents include whether the bed unit is clean and tidy, whether the dressing is replaced on time (including deep vein and superficial vein dressing), whether the pipes are replaced according to the prescribed time (including ventilator circuit, gastric tube and urinary catheter), the frequency and accuracy of risk assessment for patients (including pressure sore, fall risk assessment, nutritional risk assessment), the frequency of daily artificial airway balloon pressure detection, oral care, urinary catheter care, whether the frequency of central venous catheter flushing and sealing is up to standard, whether the pipes are fixed twice, whether the upper and lower limit alarm of ventilator is set, whether the upper and lower limit setting of bedside ECG monitor conforms to the actual situation of patients (including the setting of heart rate, respiration, pulse and blood oxygen saturation), and whether the patient's bed head elevation meets the requirements. A total of 20 assessment contents. The quality of morning care of patients was evaluated through 20 items. Each item was scored 5 points, with a full score of 100 points. The higher the score, the better the quality of morning care of patients.

2.3.2 The incidence of complications in patients. Complications included unplanned extubation, incontinence dermatitis, aspiration, stage II and above pressure injury.

2.3.3 Patient family care satisfaction

Satisfaction is divided into very satisfied, basically satisfied and dissatisfied, very satisfied and basically satisfied are satisfied.

### 2.4 Statistical Methods

SPSS 25.0 software was used for data analysis. The measurement data were expressed as mean ± standard deviation ($\bar{x}\pm s$), and the two groups were compared by two independent sample t test. The count data were expressed as the number of cases (n) and percentage (%), and the two groups were compared using the 2 test. When $P < 0.05$, the difference was considered statistically significant.

## 3. Results

### 3.1 Comparison of Nursing Quality Between the Two Groups of Patients

The results showed that the morning nursing quality score of the observation group was higher than that of the control group, and the difference was statistically significant ($P < 0.05$), as shown in table 1.

**Table 1:** Comparison of morning nursing quality scores between the two groups of patients ($\bar{x}\pm s$)

| peer group | Number of cases (n) | nursing quality score |
|---|---|---|
| control group | 58 | 90.60±5.78 |
| observer group | 58 | 96.72±3.57 |
| *t* | | -6.860 |
| *P* | | ＜0.001 |

### 3.2 Comparison of the Incidence of Nursing Adverse Events Between the Two Groups

The results showed that the incidence of nursing adverse events in the observation group was lower than that in the control group, the difference was statistically significant ($P < 0.05$), as shown in Table 2.

### 3.3 Comparison of Nursing Satisfaction Between the Two Groups of Patients' Families

The results showed that the nursing satisfaction of the family members of the observation group was higher than that of the control group, and the difference was statistically significant ($P < 0.05$), as shown in Table 3.

**Table 2:** Comparison of the incidence of nursing adverse events between the two groups (n, %)

| peer group | Number of cases (n) | Number of adverse events | | | | | Incidence (%) |
|---|---|---|---|---|---|---|---|
| | | Non planned extubation | incontinent-associated dermatitis | aspiration | pressure injury | Number of cases | |
| Control group | 58 | 2 | 3 | 1 | 2 | 8 | 13.79 |
| observer group | 58 | 0 | 1 | 0 | 1 | 2 | 3.45 |
| $\chi^2$ | | | | | | | 3.904 |
| *P* | | | | | | | 0.047 |

**Table 3:** Comparison of nursing satisfaction of family members between the two groups (n, %)

| peer group | Number of cases (n) | nursing satisfactory degree | | | | $\chi^2$ | *P* |
|---|---|---|---|---|---|---|---|
| | | very satisfactory | basically satisfactory | dissatisfied | satisfaction (%) | | |
| Control group | 58 | 28 | 23 | 8 | 86.21 | 4.336 | 0.037 |
| observer group | 58 | 41 | 16 | 1 | 96.55 | | |

## 4. Discussions

### 4.1 Necessity of Construction of Intensive Care Core Team Based on PDCA Model

High-quality care services depend on the overall care of the core team. Critically ill patients often need a variety of complex nursing operations, such as tracheal intubation nursing, deep vein catheterization maintenance, continuous electrocardiogram monitoring, etc. [9]. Therefore, core team building is urgent. The core team members include experienced nurses and head nurses. With their superb professional skills, they can perform these operations accurately and quickly, provide accurate and effective care for patients, reduce the occurrence of complications, and improve the quality of life and rehabilitation of patients [10]. At present, the nursing human resources in the ICU field of tertiary hospitals in China are still relatively tight [11]. This condition may adversely affect the quality of care and the final outcome of critically ill patients, affecting the outcome of patients [12]. Therefore, optimizing the allocation of human resources and improving work efficiency have become a top priority. Through continuous planning, implementation, inspection and treatment, the construction of intensive care core team based on PDCA model can find out the deficiencies in nursing practice in time, adjust strategies quickly, ensure the steady improvement of nursing quality, and lay a solid foundation for the stability and long-term development of ICU nursing team.

### 4.2 The Construction of Intensive Care Core Team Based on PDCA Mode is Conducive to Improving the Quality of Morning Care for Patients

The results of this study showed that the core team of intensive care based on PDCA model construction could significantly improve the quality of morning care for patients ($P < 0.05$). The research results of Xiaochun Zhan et al. [13] also show that core team building can improve the quality of nursing care such as ward management and health education. Morning nursing covers key links such as disease assessment and basic nursing, which is of core significance to critically ill patients. The results of this study verified the universal applicability and positive effects of the core team model in nursing practice. The deep value of the construction of the core team is to promote the construction of the "patient-centered" cultural atmosphere in the nursing unit. In this culture, the focus of nursing staff is more inclined to the actual feelings, comfort and satisfaction of patients, and the nursing behavior also shifts from passive implementation to

active care [14]. Specific to the morning care process, the team will fully plan and coordinate before the start of care, and clarify their respective responsibilities and potential risks; during the implementation process, members work closely with each other to ensure that the operation is accurate and efficient; after the end of nursing, the team will systematically check the nursing effect, identify possible problems or deficiencies, and formulate specific improvement measures based on the analysis results. This PDCA cycle makes morning care no longer a simple task stacking, but a dynamic process of continuous discovery, problem solving and continuous optimization.

### 4.3 The Construction of Intensive Care Core Team Based on PDCA Mode is Conducive to Reducing the Incidence of Complications in Patients

Critically ill patients are often accompanied by complex pathophysiological changes, and their physical functions are generally in a highly fragile state, which makes them very easy to become a high-risk group of common complications, such as pressure sores, deep vein thrombosis, ventilator-associated pneumonia, etc. It not only brings additional pain to patients, but also leads to life-threatening consequences in severe cases, and significantly prolongs the patient's hospitalization cycle. The results of this study showed that the construction of intensive care core team based on PDCA mode could reduce the incidence of complications ($P < 0.05$). The core team operation under the PDCA mode is mainly to continuously improve the quality. The team will regularly review the current nursing work, find out the problems and risk points, and then make improvements. In addition, through systematic training, nurses' skills and risk awareness are constantly improved, so that they can skillfully use the latest nursing methods, so as to reduce the occurrence of complications from the source. The PDCA model also focuses on standardizing and simplifying the process. This not only improves the efficiency of nursing work, but more importantly, it reduces the potential errors caused by the randomness of operation, thus improving the safety of holistic nursing [15]. Specifically, the core team will carefully assess the risk profile of each patient during the planning phase and then develop specific prevention methods. For example, for specific risks such as unplanned extubation and skin damage due to incontinence, the team will strictly follow the standard process to control. Previous studies have also clearly pointed out [16, 17] that strengthening skin care training and strictly following nursing practice guidelines can significantly reduce the incidence of incontinence-associated dermatitis. In the observation group of this study, the core team has significantly improved the professional level of skin care for patients with incontinence through special training and guidance.

### 4.4 The Construction of Intensive Care Core Team Based on PDCA Model is Conducive to Improving the Nursing Satisfaction of Patients' Families

This study showed that the construction of critical care core team based on PDCA model significantly improved the nursing satisfaction of patients' families ($P<0.05$). The satisfaction of patients and their families with nursing services is usually closely related to the level of nursing services received. It is mainly related to the following aspects: The core nursing team is usually composed of experienced and highly skilled nurses who can provide continuous, comprehensive and high-quality nursing services [18]. Through continuous professional training, the accuracy and efficiency of nursing operation are ensured, which not only strengthens the professionalism of nursing work, but also ensures the continuity of nursing process, so as to enhance the sense of peace of family members. After the construction of the core team, the communication and cooperation within the team have been effectively improved, which makes the whole nursing process smoother, can better meet the needs of patients, and provide fine and coherent nursing services. This efficient operation not only directly benefits patients, but also promotes the improvement of nursing staff's own professional quality and the enhancement of team cohesion [19, 20]. In addition, the key role of humanistic care in improving satisfaction cannot be ignored. As emphasized in the document "Medical Humane Care Enhancement Action Plan (2024-207)," strengthening the humanistic care in the intensive care unit will help improve doctor-patient communication, build a harmonious relationship, and then improve the patient's medical experience and satisfaction [21]. The core team can more keenly identify and actively respond to the emotional needs of family members. This kind of care full of humanistic temperature plays a vital role in improving family satisfaction.

In summary, the construction of intensive care core team based on PDCA mode is conducive to improving the quality of morning care and family satisfaction of patients, reducing the occurrence of complications, and providing guidance for improving the quality of care for critically ill patients.

## Fund Introduction

2022 Baise scientific research and technology development plan project (No.: Encyclopedia 20221419), 2024 Youjiang Medical College for Nationalities education and teaching reform research topic (No.: JGZHL2023-33).

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## Author Profile

**Chunxuan Wei** (1985-), female, nursing undergraduate, deputy director nurse, ICU deputy head nurse, research direction: critical care, nursing management; e-mail: 514201712 @ qq.com.

**Yanfang Lu** (1977-), female, nursing undergraduate, chief nurse, ICU head nurse, master's supervisor, research direction: critical care, nursing management