

# Construction and Implementation of Quality 3D Structure Mode in Evaluation of Operating Room Nursing Quality

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**Abstract:** Objective: To explore the implementation effect of operating room nursing evaluation system constructed by quality 3D structure mode. Method: 3D structure mode was used to construct operating room nursing evaluation system from January 2017 to December 2017. Besides, this system was applied in operating room nursing quality intervention from January 2018 to December 2018. Infection rate of surgical incision and pass rate of hygiene monitoring samples before and after the system implementation were recorded, and inter-group comparison was conducted. Results: The infection rate of surgical incision was 0.4%, and hygiene monitoring pass rate of operating room was 91.8% before the application of quality 3D structure mode. After the application, the infection rate of surgical incision was 0.1%, and hygiene monitoring pass rate of operating room was 98.5%. The data comparison differences were significant ( $p < 0.05$ ). Conclusion: The construction and application of quality 3D structure mode in evaluation of operating room nursing quality can improve operating room nursing quality, so it deserved to be promoted.

**Keywords:** operating room; quality 3D structure mode; nursing quality evaluation

## 1. Introduction

The operating room is an important place where a hospital treats patients. Since the operation will cause different degrees of trauma to patients and lead to infection and other adverse events, high requirements are proposed for operating room nursing and management quality. Air sterilization effect, sterile products and hand hygiene condition in the operation process concern operating room nursing quality. How to effectively evaluate and supervise relevant quality becomes the key point of clinical work [1]. Quality 3D structure mode is structure-process-structure mode. Correlation theory holds that this mode has significant effect when it is applied in evaluation of operating room nursing quality. In this study, the construction and implementation details of quality 3D structure mode in evaluation of operating room nursing quality were mainly studied so as to pro-

vide the reference for relevant work. The details are as below.

## 2. Data and Method

### 2.1. General Data

20 nursing and treatment experts were chosen from our hospital from January 2017 to December 2017. The inclusion requirements of nursing experts are as follows: the years of operating room nursing work: no less than 15 years, job title: associate chief nurse or above. The inclusion requirements of treatment experts are as follows: the years of surgical department work: no less than 10 years, job title: associate chief physician or above. The age of 20 nursing and treatment experts was 39-54, with the average age of  $43.26 \pm 1.09$ .

### 2.2. Method

3D structure mode was used to construct evaluation system of operating room nursing quality. First of all, Donabedian's quality 3D structure mode was used as the theoretical basis, and the actual conditions of operating rooms in the hospital to construct the primary criteria of operating room nursing quality evaluation. Relevant experts of operating rooms were invited to modify the primary criteria and propose suggestions, and the preliminary questionnaire formed. After the first round of questionnaire distribution was conducted, experts were invited to evaluate and modify relevant indexes again. When experts' opinion had certain concentration trend within the fixed scope, questionnaire survey stopped. Then, the items with high frequency of occurrence were screened, and they were listed according to the frequency [2]. After nursing quality criteria at each level were constructed, the system was applied in operating room nursing quality intervention from January 2018 to December 2018, and the effect was observed.

### 2.3. Observation Indexes

The construction of quality 3D mode was observed. Meanwhile, Infection rate of surgical incision and pass rate of hygiene monitoring samples before and after the implementation of 3D mode were recorded. The data were compared.

## 2.4. Statistical analysis

SPSS25.0 software was applied to process the data. Expert coordination coefficient (W) was used to express coordination degree of experts' opinions. Enumeration data were expressed with %, and tested with  $\chi^2$ .  $p < 0.05$  means data differences are significant.

## 3. Results

### 3.1. Coordination Degree of Experts' Opinions

Based on detection of coordination degree of experts' opinions, freedom degree of first-level indexes was small, and freedom degree of third-level indexes was significantly large.  $p$  value of indexes at each level  $< 0.05$ , as shown in Table 1.

**Table 1.** Significance of coordination degree of experts' opinions [n(%)].

Item	W	$\chi^2$	Freedom degree	$p$ value
First-level index	0.38	42.88	2	$< 0.05$
Second-level index	0.28	477.62	19	$< 0.05$
Third-level index	0.18	331.28	49	$< 0.05$

### 3.2. Evaluation Criteria of Operating Room Nursing Quality

Evaluation criteria of operating room nursing quality were preliminarily constructed. Structure quality, process quality and final quality are first-level criteria. knowledge and skill, personnel placement, environmental facility, rules and regulations, operation cooperation, sterile operation, disease observation, emergency treatment, operation records, psychological nursing, living nursing, health education, safeguard procedures, sterilization effect and infection monitoring, nursing defect result feedback, occurrence rate of falling from bed, death rate, knowledge mastery of nursing personnel, and patient satisfaction result feedback are second-level criteria. The other nursing quality details are third-level criteria.

### 3.3. Implementation Effect of 3D Structure Mode

Before the 3D structure mode was applied, the number of patients with incision wound infection among 1000 surgical patients was counted, and the infection rate was 0.4% (4/1000). After the mode was applied, the number of patients with incision wound infection among 1000 surgical patients was counted, and the infection rate was 0.1% (1/1000). Before the application of the mode, the pass rate of operating room hygiene monitoring was 91.8% (918/1000). After the application, the pass rate of operating room hygiene monitoring was 98.5% (985/1000). The inter-group comparison differences were significant ( $\chi^2$  48.637,  $p < 0.05$ ).

## 4. Discussion

The research on evaluation criteria of operating room nursing quality started from the 20th century. Since surgical treatment plays an important role for multiple dis-

eases, a large number of scholars throw themselves into evaluation and research of operating room nursing quality. In particular, the quality 3D structure mode proposed by the American scholar Donabedian has large influence in the world [3,4]. In this study, the construction of quality 3D structure mode in evaluation of operating room nursing quality was analyzed. The first-level indexes mainly include structure quality, process quality and final quality. Structure quality mainly emphasizes evaluation of instruments, equipment and organizations in the process of nursing quality evaluation. Process quality stresses nursing activity implementation in the nursing process. Final quality aims to measure the time of waiting for diagnosis and patients' satisfaction [5,6].

After relevant standards were constructed as per quality 3D structure mode, relevant standards were implemented and applied in the process of operating room nursing quality evaluation. The effective management structure system was constructed according to the current situation of operating room quality control. Based on continuous improvement of relevant management systems, the supervision intensity was enhanced to significantly reduce the occurrence rate of operating room infection and other adverse events and thus reach the purpose of promoting operating room nursing quality [7,8]. The second-level indexes in the process of quality 3D structure mode construction can help the operating room detail the control and management process of infection and other adverse events. Based on relevant standards and systems, the logical content in the management process was further detailed. Meanwhile, operating room quality evaluation system and standard were emphasized so that the nursing service quality was made strict and detailed. Then, the nursing service quality improved effectively [9,10]. In this study, the construction and application of quality 3D structure mode were analyzed in detail. The results showed that, before the construction and application, the infection rate of surgical incision was 0.4%, which decreased to 0.1% after the application; the hygiene monitoring pass rate of operating room was 91.8%, which increased to 98.5% after the application ( $p < 0.05$ ). The results fully embody the advantage of quality 3D structure mode.

In conclusion, the construction and application of quality 3D structure mode in evaluation of operating room nursing quality can improve operating room nursing quality, that is, reduce the infection rate of surgical incision and improve the pass rate of hygiene monitoring. Hence, the construction and application value of the mode is significant.

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