

Application of New Nursing Concepts in Disinfection Supply Center and its Impact on Disinfection and Sterilization Qualification Rate

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Abstract: *Purpose:* To explore the practical effects of applying new nursing concepts in the disinfection supply center. *Methods:* A retrospective analysis was conducted based on the nursing management work situation of our hospital's disinfection supply center from December 2022 to June 2023. The work situation of the routine nursing management model from December 2022 to March 2023 was included into the control group, while the nursing management work that applied a variety of new nursing concepts from April 2023 to June 2023 was included in the observation group. The two groups randomly selected 400 medical devices each as research objects to compare the medical devices under the two nursing management models. To deal with the qualifications, at the same time, a self-made questionnaire was issued to the 18 staff members involved during the study to compare the nursing management quality scores of the two groups. *Results:* The timely rate of recovery and distribution of medical devices, the qualified rate of cleaning, the qualified rate of disinfection and sterilization, the qualified rate of packaging, and the nursing management quality score of the observation group were all higher than those of the control group ($P < 0.05$). *Conclusion:* The application of new nursing concepts can help disinfection supply centers to further improve the disinfection and sterilization qualification rate of medical devices, and promote the improvement of the overall nursing management quality level, which is worthy of promotion.

Keywords: Disinfection supply center; New nursing concept; Disinfection and sterilization qualification rate; Nursing management quality

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1. Introduction

The disinfection supply center is an important part of the hospital. The quality level of its nursing management is closely related to the safety of patient treatment and the operational image of the hospital^[1]. In recent years, there have been many new nursing concepts derived, including the "Three Modernizations," the "Five Constant Methods," the Plan-Do-Check-Act (PDCA) cycle management method, etc. They have important significance in improving the quality of nursing management in departments and units. Therefore, if these new nursing concepts are organically applied to the daily nursing management work of the disinfection supply center, they can further

make up for the shortcomings of the conventional management model and help the nursing management quality of the center to reach a more satisfactory level. At the same time, it can also better promote the improvement of the comprehensive quality of nursing staff and better ensure the treatment safety of patients [2,3]. This study conducted an effective observation on the significance of the application of relevant new nursing concepts in our hospital's disinfection supply center in promoting the quality of nursing management.

2. Materials and methods

2.1. General information

A retrospective analysis was conducted on the nursing management work of the Disinfection Supply Center of our hospital from December 2022 to June 2023, and March 31, 2023 was the separation day, which means that the nursing work situation from December 2022 to March 2023 was classified as the control group, and the nursing work situation from April 2023 to June 2023 was classified as the observation group. A total of 800 surgical instruments were selected and managed, and there were 400 surgical instruments in the control group, of which 115 were from basic surgery, 68 from obstetrics and gynecology, 42 from stomatology, 28 from ophthalmology, 38 from pediatrics, and 109 from neurosurgery; there were 400 surgical instruments in the observation group, of which 108 were from basic surgery, 65 from obstetrics and gynecology, 34 from stomatology, 22 from ophthalmology, 45 from pediatrics, and 126 from neurosurgery. After comparing the data, there was no difference between groups ($P > 0.05$).

During the study period, there were 18 staff working in the center, including 1 male and 17 females; the age range was 24–45 years old, with a mean of 32.15 ± 8.14 years old; the working experience ranged from 1 to 25 years, with a mean of 12.53 ± 3.44 years; the ratio of disinfection personnel to nurses was 3:15; the ratio of education level of college to undergraduate was 12:6; marital status ratio of single to married was 7:11. Inclusion criteria included age < 55 years old and working experience ≥ 1 year; had professional qualification certificate; were aware of the research, and had documents to prove their independent will. Exclusion criteria were pregnant and lactating employees; trainees; those who had been away from work for a long time due to various reasons (leave time > 1 month); those whose positions were changed or fired during the research period.

2.2. Method

The control group still completed the recycling, cleaning, packaging, disinfection, sterilization, supplying, and other processing processes of various medical devices according to the previous routine nursing management model.

The observation group promoted and applied many new nursing concepts to the actual nursing management work of the center, including:

- (1) Promotion and implementation of the “Three Modernizations” concept: The so-called “three modernizations” refer to institutionalized management, neat display, and standardized operation. Based on strict compliance with a series of relevant management systems and guidelines for disinfection supply centers promulgated by the state, combined with the actual medical development of the unit, the relevant nursing management systems and processes in the department, and the rigorous and meticulous regulations have been improved, and center staff are required to strictly follow the requirements, and at the same time, pay attention to keeping the working environment clean, orderly, beautiful, warm, and safe at all times, so as to better improve work efficiency and maintain a pleasant and positive working attitude.
- (2) Reasonable application of “Five Constant Methods”: The so-called “five constants” refers to “always

rectifying, always cleaning, always organizing, always standardizing, and always introspecting.” This concept is incorporated into the whole-process nursing quality management work of the disinfection supply center. On the one hand, nursing management methods can provide continuous supervision, so that areas or problems that are not managed properly can be discovered in a timely manner, and they can be better improved and optimized; on the other hand, it can help the staff to change their thinking and discover their own shortcomings and problems through constant introspection, so as to more actively look for ways to make progress, constantly improve independent initiative, and value teamwork, thereby contributing to the establishment of the overall image of the department and the improvement of staff quality.

- (3) Active promotion of the PDCA cycle method: The PDCA cycle method is a contemporary new type of total quality management method in society, which mainly advocates the four processes of plan, do, check, and act; it aims to discover problems and formulate solutions, implement plans, and verify plans’ implementation effects, evaluate current management results, and resolve remaining issues in the next cycle. Through this process, limited human resources can be utilized to the maximum extent, and many effective preventive and response measures can be taken predictably. Therefore, it comprehensively largely improves the quality of nursing management work at one stage. This improvement not only includes the improvement of management systems and nursing processes, but also the professional abilities and comprehensive qualities of nursing staff, including awareness of responsibility, awareness of laws and regulations, awareness of risks, comprehensive improvement in awareness of prevention, ability to detect and solve problems, etc. For example, if the PDCA cycle method is applied in the disinfection supply center, a more scientific and humane improvement plan can be proposed based on the summary of common problems in the previous work process, including rational planning of different processing areas for medical devices, and prohibiting personnel from other areas from randomly changing duties; developing a detailed instrument cleaning chart so that personnel can intuitively master the cleaning techniques and complete work efficiently by category; after each work is completed, there must be the signature and date of the person who handled the work, so that when problems arise, they can be traced back to the source in a timely manner. At the same time, it can also increase the responsibility awareness of personnel, better restrain their own behavior, and reduce related risks.
- (4) Improvement of the performance appraisal system, reward and punishment system, and flexible shift system: Classes are organized regularly for staff in the center to learn advanced nursing concepts and technologies, and regular assessments are conducted, and the assessment results are included in the performance. A strict reward and punishment system is implemented, with comprehensive quality inspections regularly conducted at the center; those with good performance should be actively praised or rewarded, those with improper work attitudes require timely corrections and will be punished in the form of notifications, and those who make nursing errors require severe criticisms and corrections. A flexible shift system is formulated and improved based on the principle of “humanistic care” to ensure that each employee has sufficient rest time, so that they can work with a fresh and positive attitude.
- (5) Comprehensive development of Internet management: A complete Internet management platform is actively established to incorporate the daily care management of the disinfection supply center into the entire computer management system of the hospital, so that 24-hour monitoring and related adverse events can be reviewed step by step, thereby better identify and solve problems, and comprehensively improve the center’s overall care efficiency.

2.3. Observation indicators

The indicators below were observed in the groups.

(1) Qualification rate of medical device processing

Standardized statistics were carried out on the timely recovery and distribution rate, cleaning qualification rate, disinfection and sterilization qualification rate, and packaging qualification rate of the two groups of medical devices, and the observed values were compared.

(2) Nursing management quality score

When the nursing management work of the two groups had come to an end, a self-made “Nursing Management Quality Rating Form” was distributed for the two groups of staff to independently score the quality of nursing management in terms of the center’s systems, processes, personnel, etc. The division range is 0–100, and the score corresponds to the quality level of the nursing management.

2.4. Statistics

Using SPSS25.0 software as the statistical basis, all the obtained data were divided by nature. If it belongs to measurement data, it will be displayed as mean \pm standard deviation (SD), and a parallel *T* test will be performed; if it belongs to count data, it will be displayed as percentage (%). At the same time, the chi-square test is performed. If the final *P* value is smaller than 0.05, it indicates that there is a statistically significant difference.

3. Results

3.1. Comparison of medical device processing qualification rates between the two groups

As seen in **Table 1**, the timely recovery and distribution rate of medical devices, and the qualified rate of cleaning, disinfection, sterilization, and packaging of the observation group were all higher than those of the control group, $P < 0.05$.

Table 1. Comparison of medical device processing qualifications [n (%)]

Group	Timely recovery and distribution rate	Qualified rate of cleaning	Qualified rate of disinfection and sterilization	Qualified rate of packaging
Control group (n = 400)	362 (90.50)	368 (92.00)	362 (90.50)	357 (89.25)
Observation group (n = 400)	390 (97.50)	395 (98.75)	398 (99.50)	391 (97.75)
<i>T</i>	17.376	20.658	34.105	23.776
<i>P</i>	0.001	0.001	0.001	0.001

3.2. Comparison of nursing management quality scores between the two groups

From **Table 2**, the total score of nursing management quality of the observation group was significantly higher than that of the control group, $P < 0.05$.

Table 2. Comparison of nursing management quality score results (mean \pm SD, points)

Group	System	Process	Personnel	Total score
Control group (n = 18)	84.56 \pm 6.87	86.87 \pm 7.45	82.14 \pm 6.05	84.45 \pm 6.72
Observation group (n = 18)	92.45 \pm 8.78	96.33 \pm 9.45	95.87 \pm 9.24	95.05 \pm 8.99
<i>T</i>	3.003	3.335	5.274	4.007
<i>P</i>	0.005	0.002	0.001	0.001

4. Discussion

Disinfection Supply Center is an important sterile item supply unit in the hospital. It is a relatively independent work system with clear rules and complete processes. At the same time, the sterile items involved in its management scope and equipment are closely related to the normal work and operation of various departments of the hospital and the development of related medical research work, thus they also reflect the comprehensive characteristics. More importantly, the quality of nursing management of the center largely determines the high level of nosocomial infection rate, that is, the center also shoulders the important responsibility of preventing nosocomial cross-infection and protecting patient safety. Therefore, it is necessary to emphasize the quality of nursing management in the center, and actively and continuously explore various emerging nursing concepts in order to promote its nursing quality level ^[4-6].

The results in **Tables 1** and **2** show that compared with the control group, the medical device processing qualification rate and overall nursing management quality in the observation group are at a higher level, suggesting that the application of new nursing concepts is of great value. The introduction of advanced nursing concepts such as “transformation,” “impermanence method,” and PDCA cycle method can help the disinfection supply center to formulate more complete systems, such as performance appraisal system, reward and punishment system, flexible shift system, etc., which can make the staff’s work more efficient. The ability and comprehensive quality of staff can be further improved, so that they can more proactively complete relevant job functions ^[7-10]; at the same time, a more detailed and complete work process can also be determined, and with the support of Internet technology, it can move closer to scientific and standardized modern management standards ^[11,12].

5. Conclusion

In summary, the active application of a variety of new nursing concepts in the routine nursing management of the disinfection supply center can help to effectively improve the processing qualification rate of medical devices, and achieve the purpose of comprehensive quality improvement of systems, processes, and personnel. It has high promotion and clinical application value.

Disclosure statement

The author declares no conflict of interest.

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