



# Effect of Nursing Quality Management on the Nosocomial Infection Rate and Psychology State of Patients with Burn and Plastic Surgery

*Xue WANG<sup>1</sup>, Qi XU<sup>2</sup>, Xu LIU<sup>2</sup>, \*Aiqin LV<sup>3</sup>*

1. Operating Theater, Qilu Hospital, Cheeloo College of Medicine, Shandong University, Jinan 250012, P.R. China
2. School of Nursing, Shandong University, Jinan 250012, P.R. China
3. Nursing Department, Hospital of Stomatology, Cheeloo College of Medicine, Shandong University, Jinan 250012, P.R. China

\*Corresponding Author: Email: vd6n3d@163.com

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## Abstract

**Background:** To explore the effect of nursing quality management on the nosocomial infection rate and Psychology State of patients with burn and plastic surgery.

**Methods:** Overall, 92 patients with burn and plastic surgery admitted to Qilu Hospital, Jinan, China from Apr 2017 to Jul 2018 were selected, in which 46 cases were randomly selected as a control group for routine nursing management, and another 46 cases as a research group to strengthen nursing quality management. The incidence of nosocomial infection, nursing satisfaction and nurse-patient disputes were compared. MMAS-8 scale was used to compare the compliance of the two groups. SAS and SDS score were used to compare the psychological status. The recovery and discharge were compared.

**Results:** The incidence of nosocomial infection in the study group was significantly lower than that in the control group ( $P<0.05$ ). The total satisfaction rate of the study group was significantly higher than that of the control group ( $P<0.05$ ). The incidence of nurses-patients disputes was significantly lower than that of the control group. The SAS and SDS score of the study group were significantly better than the control group ( $P<0.05$ ). The healing time, blood circulation recovery time of skin wounds and discharge time in the study group were significantly better than those in the control group.

**Conclusion:** Strengthening nursing quality management can effectively reduce the nosocomial infection rate of burn and plastic surgery. It helps to further accelerate the recovery of patients and make patients' psychological state better.

**Keywords:** Nursing; Nosocomial infection rate; Compliance; Psychological state

## Introduction

Burn is a kind of complex traumatic event with different local and systemic effects that affect multiple organ systems beyond skin, often lead to disfigurement and dysfunction (1, 2). Burn is considered to be one of the most destructive conditions in emergency medicine in both developed and developing countries. According to the WHO, burn is the 11th leading cause of death in

children and the 5th leading cause of non-fatal injuries in children. Because of scars and subsequent disabilities, patients often need multiple corrective and reconstructive operations (3-5).

Nosocomial infection refers to the infection of patients during hospitalization. It is a major risk factor for death, with an average occurrence of 5-10% in hospitalized patients, especially in surgical

and intensive care units with the highest infection rate (6,7). Prevention of infection is a major concern of all health workers and health policies, and care plays an important role in any prevention aimed at reducing incidence (8). Nurses not only provide bedside patient care that directly affects infection prevention, but also play an important role in nursing coordination and create a safe environment for patients, all of which are related to infection control and prevention (9). As a part of hospital quality, nursing quality is an important symbol of medical service quality evaluation and the epitome of the whole hospital quality level. Poor nursing will increase the mortality, infection rate and many nursing accidents (10). Nurses' perception of nursing quality is not only based on an isolated event or a single process, but also formed over time through a series of interactions and direct observation of nursing (11). Strengthening the quality management of nursing helps improve the quality of nursing, reduce hospital infection and increase patients' satisfaction with nursing.

Therefore, this study planned to provide direction and basis for clinical practice by strengthening nursing quality management, to intervene patients after burn and plastic surgery, and to observe the impact on infection rate and psychological status of patients.

## Materials and Methods

### *Data of Patients*

A total of 92 patients with burn and plastic surgery admitted to Qilu Hospital, Jinan, China from Apr 2017 to Jul 2018 were selected, in which 46 cases with an average age of  $35.25 \pm 5.63$  yr were randomly selected as a control group for routine nursing management, and another 46 cases with an average age of  $37.30 \pm 6.52$  as a research group to strengthen nursing quality management.

Inclusion criteria were as follows: patients met the diagnostic and therapeutic criteria of burn and plastic surgery; patients who were tolerant of surgery; patients who had completed clinical data, and were cooperative with the treatment and follow-up. Exclusion criteria were as follows: Pa-

tients with adverse diseases such as heart, liver, kidney, or mental disorders, or those unable to communicate. The study was approved by the Ethics Committee of our hospital. Patients who participated in this research, signed the informed consent and had complete clinical data.

### *Nursing methods*

The control group was given routine nursing management, while the research group was given strengthened nursing quality management. The specific implementation is as follows: 1) To establish a nursing quality management team, with the head nurse serves as the management team leader, and develop a strict nursing management system. Nurses must strictly follow the rules to improve their awareness of the responsibility of nursing staff. 2) To strengthen training and upgrade skills: Strengthen training for nurses, enhance their nursing awareness, and improve nursing professional knowledge and practical operation level, which is also the most effective way to increase the trust between nurses and patients. 3) To improve hospital cleaning grade: strengthen the cleaning management and disinfection of wards, nurses' workshops and dressing rooms in the hospital, and strictly control the indoor temperature, humidity and ventilation to reduce the causes of infection. 4) To strengthen nurse-patient communication: strengthen the communication between nurses and patients, let patients understand the condition and how to avoid infection; strengthen patients' medical consciousness, at the same time, improve the trust between nurses and patients, and provide effective psychological comfort to patients through communication. 5) To strengthen the management of nosocomial infection cases: conduct shift discussion or meeting discussion on the previous infection cases, carry out targeted management, strengthen the awareness of infection and improve the risk awareness.

### *Observation indicators*

General data of patients were collected, including gender, age, operation time and bleeding volume. The incidence of nosocomial infection was com-

pared between the two groups. The self-made nursing satisfaction questionnaire was used to evaluate nursing satisfaction (total satisfaction = satisfaction + basic satisfaction). The rate of nurse-patient disputes between the two groups was compared. Compliance was measured by the MMAS-8 scale, and was compared between the two groups. The psychological state of the two groups was compared. The psychological state of the patients was evaluated according to anxiety SAS score and the depression SDS score. The positive cutoff values were 50 and 53, respectively, and the higher the score, the worse the mood. The recovery and discharge of the two groups were compared.

### Statistical Methods

The SPSS19.0 (Asia Analytics Formerly SPSS, China) was used for statistical analysis. The

measurement data were expressed as cases/percentage [n(%)]. Comparison of rates between the two groups was conducted by  $\chi^2$  test. The counting data were expressed as mean $\pm$ sd. The inter-group comparison was performed by independent sample *t* test, and ( $P<0.05$ ) indicated that there was statistical significance.

## Results

### General Information

There was no significant difference in gender, age, BMI, smoking history and alcohol abuse history between the two groups. There was no significant difference in burn defect location and lesion area. There was no significant difference in operation time and bleeding volume between the two groups (Table 1).

**Table 1:** General Information of Patients in two groups

Variable	Control group (n=46)	Research group (n=46)	$\chi^2/t$	P
Gender [n(%)]			0.045	0.832
Male	28 ( 60.87 )	27 ( 58.70 )		
Female	18 ( 39.13 )	19 ( 41.30 )		
Age(yr)	35.25 $\pm$ 5.63	37.30 $\pm$ 6.52	1.614	0.110
BMI ( kg/m <sup>2</sup> )	22.63 $\pm$ 1.33	22.51 $\pm$ 1.41	0.703	0.484
Smoking history [n(%)]			0.425	0.514
Yes	31 ( 67.39 )	28 ( 60.87 )		
No	15 ( 32.61 )	18 ( 39.13 )		
Alcoholism history [n(%)]			0.276	0.599
Yes	10 ( 21.74 )	9 ( 19.57 )		
No	36 ( 78.26 )	37 ( 80.43 )		
Burn defect site [n(%)]				
Anterior cervical scar	7 ( 15.22 )	6 ( 13.04 )	0.090	0.765
Scalp defect	8 ( 17.39 )	10 ( 21.74 )	0.276	0.599
Perioral scar	16 ( 34.78 )	14 ( 30.44 )	0.198	0.657
Limb scar	15 (32.61 )	16 ( 34.78 )	0.049	0.825
Lesion area ( cm <sup>2</sup> )	42.28 $\pm$ 12.41	41.02 $\pm$ 13.84	0.460	0.647
Operation time ( h )	2.63 $\pm$ 1.29	2.78 $\pm$ 1.38	0.539	0.592
Bleeding volume ( ml )	512.25 $\pm$ 86.87	509.35 $\pm$ 92.98	0.155	0.878

### Comparisons of the incidence of infection

The number of infected persons in the control group was 11 (23.91%) and 4 (8.70%) in the study group. It can be seen that the incidence of

infection in the study group was significantly lower than that in the control group ( $P=0.048$ ) (Table 2).

### Comparison of nursing satisfaction

The number of satisfaction and dissatisfaction in the study group was significantly higher than that in the control group, with statistical significance ( $P=0.012$ ,  $P=0.006$ ). There was no significant

difference in the number of basic satisfaction between the two groups ( $P=0.650$ ). The total satisfaction rate in the study group was significantly better than that in the control group, with statistical significance ( $P=0.006$ ) (Table 3).

**Table 2:** Infection of the two groups

Variable	Control Group (n=46)	Research Group (n=46)	$\chi^2$	P
Infected subjects	11(23.91)	4(8.70)	3.903	0.048
Uninfected subjects	35(76.09)	42(91.30)		

**Table 3:** Comparison of nursing satisfaction [n (%)]

Variable	Control group (n=46)	Research Group (n=46)	$\chi^2$	P
Satisfaction	18 ( 39.13 )	30 ( 65.22 )	6.273	0.012
Basic satisfaction	15 ( 32.61 )	13 ( 28.26 )	0.205	0.650
Dissatisfaction	13 ( 28.26 )	3 ( 6.52 )	7.566	0.006
Total satisfaction rate	33 ( 71.74 )	43 ( 93.48 )	7.566	0.006

### Comparison of Nurse-patient Dispute Rate

The number of nurse-patient disputes in the study group due to lack of professional knowledge was significantly higher than that in the control group, with statistical significance ( $P=0.041$ ). There was no significant difference in the number of nurse-patient disputes between

the two groups due to service attitude and nursing level ( $P=0.307$ ,  $P=0.307$ ). The incidence of total nurse-patient disputes in the study group was significantly lower than that in the control group, with significant difference ( $P=0.013$ ) (Table 4).

**Table 4:** Comparison of nurse-patient dispute rate [n (%)]

Variable	Control group (n=46)	Research group (n=46)	$\chi^2$	P
Service attitude	3 ( 6.52 )	1 ( 2.17 )	1.046	0.307
Lack of professional knowledge	4 ( 8.70 )	0 ( 0.00 )	4.182	0.041
Nursing level	3 ( 6.52 )	1 ( 2.17 )	1.046	0.307
Total incidence of Nurse-patient disputes	10 ( 21.74 )	2 ( 4.35 )	6.133	0.013

### Comparison of compliance

The score of MMAS-8 scale showed that the study group ( $5.89\pm 1.14$ ) was significantly higher

than that in the control group ( $5.23\pm 0.77$ ), and the difference was statistically significant ( $P=0.002$ ) (Table 5).

**Table 5:** Comparison of compliance

	Control Group (n=46)	Research Group (n=46)	t	P
MMAS-8 rating scale	5.23±0.77	5.89±1.14	3.254	0.002

### Comparison of psychological state

Compared with the SAS and SDS score of the two groups 2 weeks after operation, the score of

the study group was significantly higher than that of the control group, and the difference was statistically significant ( $P < 0.001$ ) (Table 6).

**Table 6:** Comparison of psychological state

Variable	Control group (n=46)	Research group (n=46)	t	P
SAS score	51.84±6.62	44.64±5.69	5.594	<0.001
SDS score	52.61±5.87	45.62±5.33	5.980	<0.001

### Comparison of prognosis

The healing time, blood circulation recovery time of skin wounds and discharge time in the study

group were significantly shorter than those in the control group, and the difference was statistically significant ( $P < 0.05$ ) (Table 7).

**Table 7:** Comparison of prognosis (d)

Variable	Control group(n=46)	Research group(n=46)	t	P
The healing time of skin wounds	17.63±5.89	13.63±5.31	3.392	0.001
Blood circulation recovery time of skin wounds	25.89±6.87	18.65±5.19	5.703	<0.001
Discharge time	36.34±7.68	28.64±6.39	5.227	<0.001

## Discussion

Burn wound is a multifactorial process involving the pathophysiological processes of various systems in the body. Its possible impact on a person's life includes damage to their aesthetic appearance, interpersonal relationships, psychology, social and physical functions (12). The physiological, psychological and social needs of burn patients require close cooperation of a wide range of health care professionals to cope with postoperative recovery and infection risks, with the ultimate goal of restoring patients to the optimal level of physical and mental health and social function (13, 14).

Except for the surgical treatment of patients, postoperative care for patients is an important guarantee to ensure the recovery of patients (15). As the main provider of bedside care and the intermediary between patients and clinicians, nurses work on various aspects of patient care, including direct care and monitoring of health status, emotional support for patients and families, assistance in daily life activities, inter-professional teamwork and patient education (15).

For burn patients, due to the varying severity of the epidermis, the anti-infection ability of the body surface is seriously reduced, and postoperative infection is the primary problem to be faced. Nurse care is not only important for the adverse reactions of patients and patients' views on nursing, but also crucial for the prevention of infection in burn patients (16,17).

In our study, the nosocomial infection rate in the study group was significantly lower than that in the control group, which was related to the fact that we improved the quality of care in the study group, reduced the incidence of infection in patients, which means that the recovery of patients accelerated. In our study, the healing time, blood circulation recovery time of skin wounds and discharge time in the research group were significantly shorter than those in the control group, which achieved the ultimate goal of strengthening nursing quality management for patients with burns and plastic surgery. Furthermore, nursing satisfaction is the most important predictor of patients' overall satisfaction with hospital nursing (18, 19). Strengthening communication with patients and improving the quality of nursing can

also increase patients' satisfaction on the basis of effective reduction of nosocomial infection rate.

In terms of patient compliance and nurse-patient dispute rates, the study group was also significantly better than the control group, which is also an improvement in patient nursing satisfaction. In addition, the disfigurement of the patient's body after burn will lead to greater psychological pressure, and it is easy to have adverse negative emotions and psychological pressure, and fear of adverse consequences such as treatment failure (20). This is not conducive to the postoperative recovery of patients, and in the communication with patients, nurses can use professional medical knowledge to provide effective psychological comfort to patients and effectively relieve patients' unhealthy emotions. In our study, the SAS and SDS scores of the study group were significantly higher than those of the control group, which indicated that the patients' bad mood could be reduced by nurses through effective communication.

Nurses' strict adherence to nursing guidelines will help prevent infection and effectively improve the quality of care (21). Moreover, a study (22) has revealed that the nursing working environment is one of the factors affecting the occurrence of adverse events in hospital patients. A good nursing practice environment can not only reduce the adverse events such as hospital infection and drug errors, but also improve the overall quality of nursing (22). A stable nurse's team has the ability to achieve high quality nursing outcomes. Patient safety is the responsibility of nurses, doctors, nursing leaders and managers, so creating an environment to support the development of interdisciplinary teams is an effective way of nursing quality management (23). On this basis, we need to continuously improve and perfect the nursing quality management program, to provide specific nursing care for the actual individual, and to formulate more scientific and effective management strategies to adapt to the changeable environment and continuous advancement (24).

There were still some limitations in our research. Because there were only 92 cases in our research sample, we could not acquire large sample data, which would lead to some errors in our research results. Furthermore, although our research group strengthened nursing quality management in strict accordance with the implementation standards, there would be some deficiencies in our nursing, which is also one of the reasons for the deviation of our experimental results. We plan to correct our imperfections in future research.

## Conclusion

Strengthening nursing quality management can effectively reduce the nosocomial infection rate of burn and plastic surgery, as well as the incidence of nurse-patient disputes, improve patient satisfaction, help further accelerate the recovery of patients and make patients' psychological state better. Therefore, the nursing effect is exact and worthy of promotion.

## Ethical considerations

Ethical issues (Including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, redundancy, etc.) have been completely observed by the authors.

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## Conflict of interest

The authors declare that there is no conflict of interest.

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