

Review Article

Effects of operating room detail nursing on postoperative infections and nursing satisfaction in patients undergoing radical hysterectomies

Juan Teng¹, Yehua Zhang², Cuiling Yu³

¹Operating Room, Departments of ²Nursing, ³Anesthesiology, Jiaozhou People's Hospital, Jiaozhou, Shandong Province, China

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Abstract: The present study aimed to explore the effects of operating room detail nursing (ORDN) on postoperative infections and nursing satisfaction in patients undergoing radical hysterectomies. Eighty-eight patients with cervical cancer were enrolled and divided into Groups A and B. Forty-eight cases in Group B were treated with conventional operating room nursing (ORN). The other 40 cases in Group A were treated with ORDN based on Group B. They were observed with respect to emotional changes, before and after nursing, as well as inflammatory cytokines, infection rates, satisfaction after nursing, postoperative clinical indices, and quality of life (QOL). Inflammatory cytokine levels and infection rates in Group A were lower than those in Group B ($P < 0.05$). Emotions in Group A were better than those in Group B after nursing ($P < 0.05$). Total satisfaction and QOL in Group A were higher than those in Group B ($P < 0.05$). In conclusion, ORDN can reduce postoperative infections and improve nursing satisfaction in patients undergoing radical hysterectomies.

Keywords: ORDN, radical hysterectomy, postoperative infection, nursing satisfaction, individual nursing

Introduction

Cervical cancer is the fourth most common malignant epithelial tumor formed in the cervix, worldwide [1-3], with 52,000 new cases and 26,000 deaths reported every year [4]. A major cause of the disease is human papillomavirus (HPV) infection [5], which is related to almost all cervical cancers, including cervical squamous cell carcinoma (70%), cervical adenocarcinoma (25%), or mixed tumors, based on histology [6]. Although current nursing standards for cervical cancer include surgery, radiotherapy, and chemotherapy, conventional chemotherapy not only cannot cause a therapeutic response but also may lead to serious systemic toxicity [7]. Thus, surgical treatment has been accepted by most patients [8]. Radical hysterectomy procedures are the standard recommendation for patients with early cervical cancer [9]. These procedures are helpful for patient survival, according to recent analysis [10]. This major operation causes serious pain. Inadequate treatment of moderate-

to-severe pain after surgery has been associated with the increased risk of progression to chronic pain [11]. Therefore, surgical management is essential. A patient-centered individual nursing plan, a frequently mentioned tool and a formal process in which clinicians and patients collaborate to formulate longitudinal therapeutic plans, can improve nursing quality with complex medical and high individual needs. According to a related report, patient-centered nursing is crucial for the management of chronic and multiple diseases [13]. In the present study, the effects of operating room detail nursing (ORDN), a component of individual nursing, on postoperative infections and nursing satisfaction in patients undergoing radical hysterectomies were explored.

Materials and methods

General information

Eighty-eight patients with cervical cancer were enrolled and divided into Groups A and B. A

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Table 1. General information table [n (%)]

Categories	Group A (n=40)	Group B (n=48)	t/ χ^2 value	P value
Age (Years)	42.58±4.29	43.23±4.26	0.710	0.479
Height (cm)	166.38±2.48	167.38±2.44	1.900	0.060
Body weight (kg)	55.27±4.24	56.41±4.13	1.274	0.206
Place of residence			0.058	0.808
Countryside	14 (36.00)	18 (37.50)		
City	26 (65.00)	30 (62.50)		
Educational history			0.349	0.554
Below senior high school	11 (27.50)	16 (33.33)		
Above senior high school	29 (72.50)	32 (66.67)		
Nationality			0.724	0.394
Han	33 (82.50)	36 (75.00)		
Ethnic minorities	7 (17.50)	12 (25.00)		
Economic level			0.313	0.855
Poor	7 (17.50)	10 (20.83)		
Well-off	24 (60.00)	26 (54.17)		
Rich	9 (22.50)	12 (25.00)		
Staying up			0.258	0.611
Yes	23 (57.50)	25 (52.08)		
No	17 (42.50)	23 (47.92)		
Doing exercises			0.000	>0.999
Yes	25 (62.50)	30 (62.50)		
No	15 (37.50)	18 (37.50)		
Obesity			0.125	0.722
Yes	16 (40.00)	21 (43.75)		
No	24 (60.00)	27 (56.25)		
Diabetes			0.082	0.773
Yes	13 (32.50)	17 (35.42)		
No	27 (67.50)	31 (64.58)		
Hypertension			0.098	0.754
Yes	17 (42.50)	22 (45.83)		
No	23 (57.50)	26 (54.17)		
Smoking			0.195	0.658
Yes	14 (35.00)	19 (39.58)		
No	26 (65.00)	29 (60.42)		
Drinking			0.074	0.784
Yes	18 (45.00)	23 (47.92)		
No	22 (55.00)	25 (52.08)		
Disease types			0.286	0.592
Squamous carcinoma	19 (47.50)	24 (50.00)		
Adenocarcinoma	9 (22.50)	13 (27.08)		
Adenosquamous carcinoma	12 (30.00)	11 (22.92)		
Tumor size (cm)			0.163	0.686
<1	9 (22.50)	13 (27.08)		
1~2	11 (27.50)	15 (31.25)		
2~3	15 (37.50)	12 (25.00)		
3~4	5 (12.50)	8 (16.67)		

total of 48 cases in Group B were treated with conventional operating room nursing (ORN). The other 40 cases in Group A were treated with ORDN based on Group B.

Inclusion and exclusion criteria

Inclusion criteria: Patients with cervical cancer with tumor size <4 cm, internal OS integrity, and no extra-uterine spread were included through CT imaging [14]. All patients and family members were informed of this study and provided informed consent. The present study was approved by the Ethics Committee of Jiaozhou People's Hospital.

Exclusion criteria: Patients with hepatic, renal, and cardiac insufficiencies; Patients with major hematological diseases; Patients with communication disorders, as well as those hiding something from medical personnel; Patients complicated with tumors.

Nursing methods

ORDN for patients in Group A: Preoperative nursing: the nursing staff relieved patient stress and anxiety levels produced before and after the operation through attention diversion. The aim was to keep them happy physically and mentally, reducing their tightness. The staff adopted their opinions, understood nursing deficiencies, and rectified and supplemented

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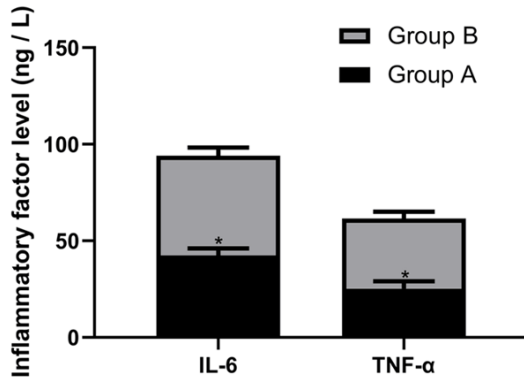


Figure 1. Comparison of inflammatory cytokines after nursing. IL-6 and TNF- α levels in Group A were lower than those in Group B after nursing ($P < 0.05$). Note: * indicates $P < 0.05$ compared with that in Group B.

the deficiencies. Thus, preoperative high-quality and high-service nursing could be continuously provided for them. Health education was carried out. Patient demands were understood and their questions were answered. Health popularization was also carried out, ensuring the patients understood all relevant medical knowledge and first aid measures.

Intraoperative nursing: the nursing staff paid close attention, memorized every step of the operation by heart, and cooperated with the surgeons carefully. They further disinfected the operating room and surgical instruments carefully, aiming to maintain sterility and tidiness. In addition, the staff paid close attention to patient vital signs during the operation, immediately reporting any abnormalities to the doctor.

Postoperative nursing: the nursing staff formulated different eating plans based on the different stages of patient postoperative recoveries. They informed patients about diet taboos, avoiding stimulation of wound recurrence and infections by spicy food. The patients supplemented corresponding nutrition based on their own recovery over time to avoid physical weakness due to lack of nutrition. The nursing staff took the patients out for relaxation every day. This helps to avoid emotional depression. Moreover, they disinfected the wards frequently. The staff reasonably adjusted the temperature and humidity of the wards, observing the patients' vari-

ous physical indicators every day. They asked whether they have discomfort. If there was any discomfort, they contacted the doctor as soon as possible to avoid delaying treatment. The staff guided the patients in maintaining health and paying attention to their own surgical wounds in time, to prevent bleeding or inflammation. The staff helped to relieve minor pain levels for the patients. However, they contacted and informed the doctor of all details in time if they had severe pain, providing appropriate treatment.

Patients in Group B were treated with conventional ORN. Before the operation, the nursing staff routinely prepared for the operation, including routinely disinfecting surgical instruments, preparing surgical items, and assisting the patients in positioning. During the operation, they assisted the physicians. After the operation, they provided patients with appropriate assistance and nursed their surgical sites.

Outcome measures

1) Self-Rating Anxiety Scale (SAS) [15] and Self-Rating Depression Scale (SDS) [16] scores were used to observe patient anxiety and depression levels. Scores were positively correlated with patient anxiety and depression. 2) Postoperative venous blood (5 mL) was collected from patients in the two groups. It was allowed to stand for 20 minutes, then centrifuged in a centrifuge ($10 \times g$ at 4°C for 15 minutes, Beijing BMH Instruments Co., Ltd.) to separate the serum. The serum was quickly frozen in liquid nitrogen and stored at -80°C for later use. Enzyme-linked immunosorbent assay (ELISA) was used to detect interleukin-6 (IL-6) and tumor necrosis factor- α (TNF- α). 3) Visual Analogue Scale (VAS) [17] scores were used to compare patient postoperative pain levels, with a total score of 10 points. Scores were positively correlated with pain severity. 4) 36-Item Short-Form Health Survey (SF-36) [18] was used to score physical function, activity of daily living, psychological function, and quality of life (QOL) levels, with a total score of 100 points. Higher scores indicate better QOL.

Statistical methods

SPSS 20.0 (SPSS, Inc., Chicago, IL, USA) was used for statistical analysis. Measurement

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Table 2. Comparison of infection and complications [n (%)]

Complications	Group A (n=40)	Group B (n=48)	X ²	P
Incision infection	1 (2.50)	3 (6.25)	-	-
Urinary infection	1 (2.50)	3 (6.25)	-	-
Urinary retention	0 (0.00)	2 (4.17)	-	-
Fever	1 (2.50)	2 (4.17)	-	-
Nausea	0 (0.00)	3 (6.25)	-	-
Vomiting	1 (2.50)	2 (4.17)	-	-
Total incidence	4 (10.00)	15 (31.25)	5.820	0.015

data are expressed by mean \pm standard deviation, with comparisons conducted by t-tests. Count data are expressed by percentages (%), with comparisons conducted by Chi-square tests. $P < 0.05$ indicates that differences are statistically significant.

Results

Comparison of general information

There were no differences in general information between Groups A and B ($P > 0.05$). See **Table 1** for details.

Comparison of inflammatory cytokines after nursing

After nursing, IL-6 levels in Groups A and B were (42.48 \pm 3.58) ng/L and (51.53 \pm 4.24) ng/L, respectively, while TNF- α levels were (25.18 \pm 3.91) ng/L and (36.39 \pm 3.50) ng/L, respectively. After nursing, IL-6 and TNF- α levels in Group A were lower than those in Group B ($P < 0.05$). See **Figure 1** for details.

Comparison of infection and complications

The total incidence of infections and complications in Group A (10%) was lower than that in Group B (31.25%) ($P < 0.05$). See **Table 2** for details.

Comparison of clinical indices

The time of first getting out of bed in Groups A and B was (22.48 \pm 4.58) hours and (28.49 \pm 6.29) hours, respectively. The first exhaust time in the two groups was (31.59 \pm 4.52) hours and (40.28 \pm 4.69) hours, respectively. Catheter indwelling time in the two groups was (3.57 \pm 0.28) days and (4.79 \pm 0.54)

days, respectively. Hospitalization time in the two groups was (7.24 \pm 0.78) days and (8.44 \pm 1.12) days, respectively. VAS scores in the two groups were (3.24 \pm 1.32) points and (4.68 \pm 1.45) points, respectively. Related clinical indices in Group A were better than those in Group B ($P < 0.05$). See **Figure 2** for details.

Comparison of anxiety before and after nursing

Before and after nursing, SAS scores in Group A were (37.72 \pm 3.54) points and (17.28 \pm 2.58) points, respectively, while those in Group B were (38.57 \pm 3.49) points and (26.43 \pm 3.14) points, respectively. After nursing, SAS scores in the two groups reduced ($P < 0.05$). Before nursing, there were no differences in scores between the two groups ($P > 0.05$). After nursing, scores in Group A were lower than those in Group B ($P < 0.05$). See **Figure 3** for details.

Comparison of depression before and after nursing

Before and after nursing, SDS scores in Group A were (40.48 \pm 4.28) points and (22.35 \pm 3.14) points, respectively, while those in Group B were (39.89 \pm 4.27) points and (29.43 \pm 3.25) points, respectively. After nursing, SDS scores in the two groups reduced ($P < 0.05$). Before nursing, there were no differences in scores between the two groups ($P > 0.05$). After nursing, scores in Group A were lower than those in Group B ($P < 0.05$). See **Figure 4** for details.

Comparison of nursing satisfaction

The total satisfaction in Group A (90%) was higher than that in Group B (70.83%) ($P < 0.05$). See **Table 3** for details.

Comparison of QOL

Scores concerning physical function, activity of daily living, psychological function, and QOL in Group A were higher than those in Group B ($P < 0.05$). See **Table 4** for details.

Discussion

A pleiotropic cytokine that exerts a variety of functions *in vivo* [19], IL-6 can be used as a

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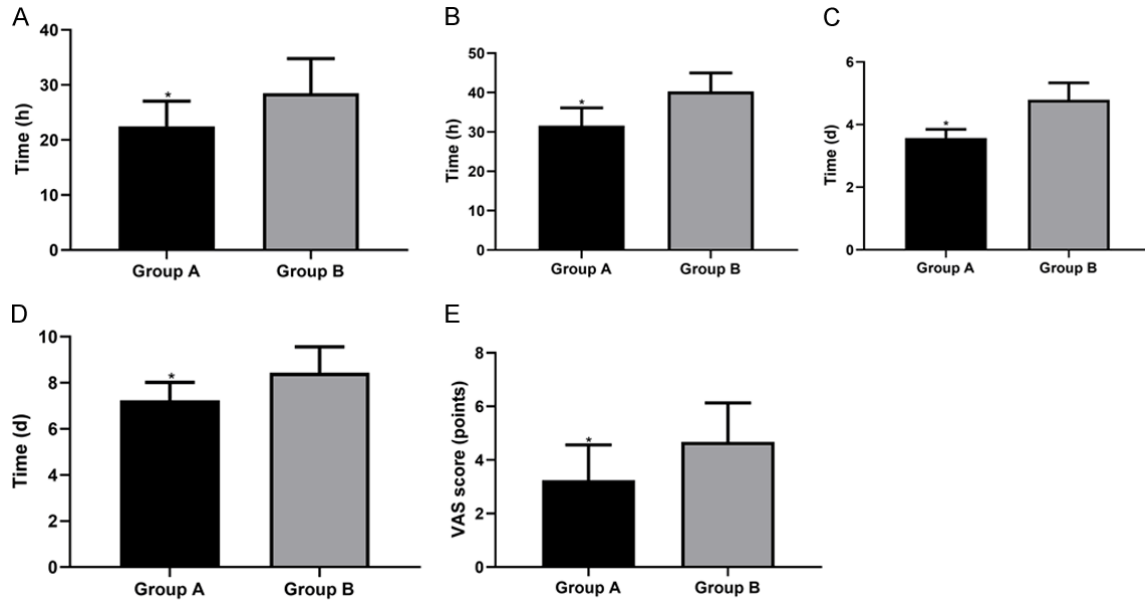


Figure 2. Comparison of clinical indices after nursing. A. The time of first getting out of bed in Group A was significantly shorter than that in Group B ($P < 0.05$). Note: * indicates $P < 0.05$ compared with that in Group B; B. The first exhaust time in Group A was significantly shorter than that in Group B ($P < 0.05$). Note: * indicates $P < 0.05$ compared with that in Group B; C. Catheter indwelling time in Group A was significantly shorter than that in Group B ($P < 0.05$). Note: * indicates $P < 0.05$ compared with that in Group B; D. Hospitalization time in Group A was significantly shorter than that in Group B ($P < 0.05$). Note: * indicates $P < 0.05$ compared with that in Group B; E. VAS scores in Group A were significantly lower than those in Group B ($P < 0.05$). Note: * indicates $P < 0.05$ compared with that in Group B.

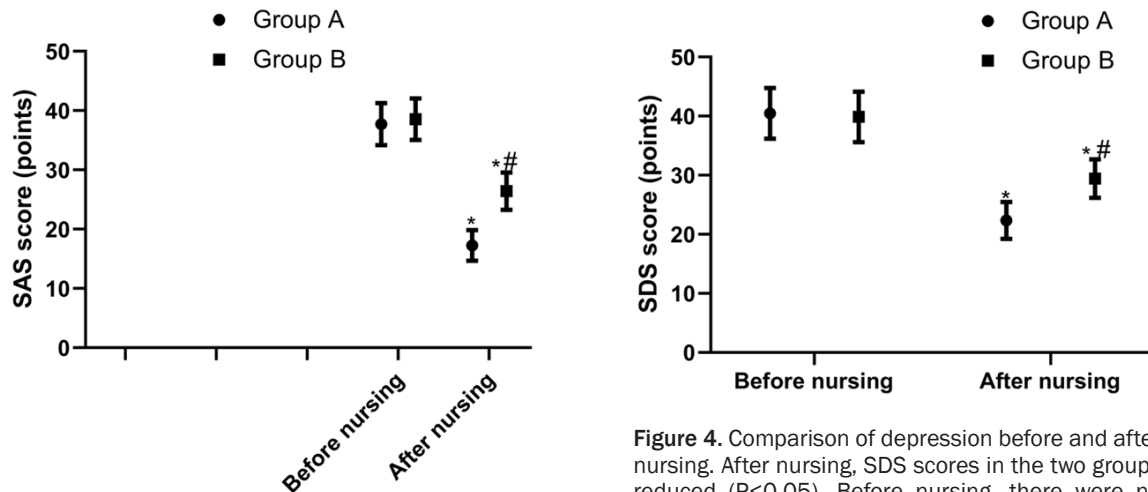


Figure 3. Comparison of anxiety before and after nursing. After nursing, SAS scores in the two groups reduced ($P < 0.05$). Before nursing, there were no differences in SAS scores between the two groups ($P > 0.05$). After nursing, SAS scores in Group A were lower than those in Group B ($P < 0.05$). Note: * indicates $P < 0.05$ compared with that in the same group before nursing. # indicates $P < 0.05$ compared with that in Group A.

Figure 4. Comparison of depression before and after nursing. After nursing, SDS scores in the two groups reduced ($P < 0.05$). Before nursing, there were no differences in SDS scores between the two groups ($P > 0.05$). After nursing, SDS scores in Group A were lower than those in Group B ($P < 0.05$). Note: * indicates $P < 0.05$ compared with that in the same group before nursing. # indicates $P < 0.05$ compared with that in Group A.

multifunctional regulator of immune response and hematopoietic function [20]. It is a trophic

cytokine that plays a central role in the comprehensive immune defense network against infections [21]. It widely affects cells of the immune and non-immune systems. It usually shows hormone-like characteristics that affect

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

Satisfaction	Group A (n=40)	Group B (n=48)	X ²	P
Satisfied	16 (40.00)	8 (16.67)	-	-
Relatively satisfied	15 (37.50)	17 (35.42)	-	-
Generally satisfied	5 (12.50)	9 (18.75)	-	-
Dissatisfied	4 (10.00)	14 (29.17)	-	-
Total satisfaction	36 (90.00)	34 (70.83)	4.926	0.026

Table 4. Comparison of QOL

Groups	n	Physical function	Activity of daily living	Physiological function	QOL
Group A	40	85.35±14.17	91.37±9.72	88.92±7.18	92.32±9.36
Group B	48	77.73±13.28	83.17±11.37	81.18±9.27	80.59±10.48
t		2.600	3.595	4.311	5.486
p		0.011	0.000	<0.001	<0.001

steady-state process [22]. TNF- α , a pro-inflammatory cytokine, has a great effect on the pathogenesis of several diseases [23], possibly triggering death or tumor growth [24]. IL-6 and TNF- α have been considered as important mediators of inflammatory response. In this study, levels in Group A were lower, which may be due to the close monitoring of various indicators and all-round disinfection during ORDN. Inflammation is the host's protective response to infection and tissue damage, beneficial to the host under normal circumstances. However, inflammatory disorders lead to excessive or lasting tissue damage, resulting in the progression of acute or chronic inflammatory diseases. Therefore, the reason for less infections in Group A in this study may be that inflammatory cytokine levels in Group A were lower than those in Group B. According to some studies, patients with a nursing plan have better control over systolic blood pressure and low-density lipoprotein, compared to those without a nursing plan. Thus, the use of statins is more likely in the former [25]. These factors suggest that a designated nursing plan is more conducive to disease control. Most patients suffer from emotional disorders for treatment relatively late during disease progression. This is of great concern, because the delay of emotional relief reduces the success rate of subsequent treatment. Depressive episodes have a negative cumulative effect on the brain and body [26]. Moreover, negative emotions seriously affect self-perception, being closely related to disease prevention and

treatment [27]. Therefore, in the current study, negative patient emotions were relieved by the medical staff throughout the process. This helped to reduce their resistance to surgery and treatment. The current study also compared SAS and SDS scores between the two groups, before and after nursing. Scores in Group A were better than those in Group B. This suggests that individual nursing can relieve patient psychological distress and negative effects [28]. According to a previous study, individual nursing can solve unresolved problems, including emotions, functional

status, happiness, mental process, and other variables. It seems to be more effective than conventional treatment [29]. This decision model improves patient knowledge, satisfaction, physical health, and mental health, as well as trust in providers [30]. In short, this patient-centered model is timely and sustainable, enabling patients to participate in treatment. This method helps to develop their health management capabilities, enabling them express concerns and preferences regarding treatment [31]. Compared with traditional nursing, this model improves or provides the same disease control, strengthens self-management strategies, and reduces the massive use of resources. Moreover, it is more cost-efficient [32].

In summary, ORDN can reduce postoperative infections and improve nursing satisfaction levels in patients undergoing radical hysterectomies.

Disclosure of conflict of interest

None.

Address correspondence to: Cuiling Yu, Department of Anesthesiology, Jiaozhou People's Hospital, No. 180, Huzhou Road, Jiaozhou, Shandong Province, China. E-mail: yuou6062177@163.com

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