Impacts of Operating Room Refined Nursing on Orthopedic Surgery Patients

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Abstract: *Objective:* To explore the impacts of operating room refined nursing on orthopedic surgery patients. *Methods:* A sample of 62 orthopedic surgery patients admitted from March 2022 to March 2023 were randomly divided into two groups, with 31 patients each. Group A received operating room refined nursing while Group B received routine nursing. Emotion, pain, quality of nursing, quality of life, complications, and differences in nursing satisfaction were compared between the two groups. *Results:* The scores of Self-Rating Anxiety Scale (SAS), Self-Rating Depression Scale (SDS), and Visual Analogue Scale (VAS) of orthopedic surgery patients in Group A were all lower than those in Group B, $P < 0.05$; the scores of each nursing quality index in Group A were higher than those in Group B, $P < 0.05$; the SF-36 (36-Item Short Form Health Survey) scores of Group A were higher than Group B, $P < 0.05$; the complication rate in Group A was lower than that in Group B, $P < 0.05$; the nursing satisfaction in Group A was higher than that in Group B, $P < 0.05$. *Conclusion:* Operating room refined nursing can reduce postoperative pain, soothe the emotions of orthopedic surgery patients, strengthen the quality of nursing, and reduce postoperative complications, which is efficient and feasible for clinical application.

Keywords: Orthopedic surgery; Refined nursing; Operating room nursing

1. Introduction

Fractures are related to soft tissue damage, tumor compression, violent trauma, and other factors, and require surgical repair to correct the bone tissue structure and restore bone function. Orthopedic surgery encompasses various levels of complexity and can address a range of conditions, including lumbar spinal lesions, joint lesions, broken fingers, and fractures in different areas of the body [1]. Routine clinical nursing typically involves assessing perioperative drainage and providing symptomatic treatment for postoperative complications. This passive service model has limitations, resulting in poor overall nursing quality [2]. With a high clinical emphasis on the quality of orthopedic nursing, the refined nursing model has been gradually improved to provide patients with orthopedic diseases with comprehensive psychological, mental, and disease nursing, improve the content of refined nursing, and make orthopedic nursing services more scientific, standardized, and efficient [3]. This article explores the impacts of an operating room refined nursing model on 62 orthopedic surgery patients

admitted from March 2022 to March 2023.

2. Materials and methods

2.1. Materials

A sample of 62 orthopedic surgery patients admitted from March 2022 to March 2023 were randomly divided into two groups. There was no difference in the data of orthopedic surgery patients in Group A and Group B, $P > 0.05$. The details are presented in **Table 1**.

Table 1. Analysis of the data of orthopedic surgery patients

| Group | n | Gender | | Age (years) | | Surgery type | | | |
		Male	Female	Range	Mean	Spine surgery	Joint replacement surgery	Fracture surgery	Other surgeries
Group A	31	16 (51.61)	15 (48.39)	35–68	52.84 ± 2.36	6 (19.35)	9 (29.03)	10 (32.26)	5 (16.13)
Group B	31	17 (54.84)	14 (45.16)	35–69	52.82 ± 2.39	7 (22.51)	8 (25.81)	11 (35.48)	4 (12.90)
χ^2/t	-	0.0648		0.0332		0.0498			
P	-	0.7991		0.9737		0.9918			

2.2. Inclusion and exclusion criteria

Inclusion criteria included patients with orthopedic diseases consistent with the "Clinical Disease Diagnosis and Treatment Criteria" [4]; imaging shows indications for orthopedic surgery; patients with informed consent; and patients with stable vital signs.

Exclusion criteria were patients with malignant tumors; patients with abnormal coagulation indexes; and patients with systemic infection.

2.3. Methods

Group A received operating room refined nursing:

(1) Preoperative refined management

Psychological counseling was provided for the patients. Orthopedic patients are prone to fear and anxiety related to their condition and concerns about the effectiveness of surgery, which can adversely affect the patient's physical and mental health. Therefore, increasing communication with patients, soothing patients' emotions, providing education on surgical knowledge, and sharing successful surgical cases can help patients cope with the surgery in a positive physical and mental state.

Instrument and environment preparation was carried out before surgery. This included disinfecting operating room surfaces and instruments before surgery; preparing sterilized cotton balls, hemostatic gauze, and other dressings; preparing the instruments required for orthopedic surgery, including traction instruments, clamping instruments, cutting instruments, sutures, lines and drainage materials, etc.; and classifying the medical clothing in the operating room.

Furthermore, clothes were changed before surgery. Hand disinfection was done by using disinfectant and hand sanitizer, sterile clothes were put on after disinfection, and the non-contact dressing method was strictly followed. Clothes and caps were changed before entering the surgical operation area and special shoes were put on. Using pants to secure the top when wearing surgical gowns can prevent exposure to iatrogenic infections and protect the safety of medical staff. The medical staff undergo a skin check for infections and nail length before entering the operating room, approval

for entry is granted only when they meet the requirements of the operating room.

Preoperative drugs and anesthesia preparation was another aspect in operating room refined nursing. Once inside the operating room, a recheck of the required drugs for the operation was conducted to ensure nothing was missing, and preparations for anesthesia were made. Patients under general anesthesia must enter the operating room 30–40 minutes in advance.

Additionally, appropriate limb placement of the patients was ensured. In order to ensure safety and comfort during the orthopedic surgery, the patients were assisted in placing their limbs appropriately before surgery. The limb placement should be fully exposing the surgical site, avoiding compression of blood vessels and nerves, and protecting circulatory function, with the limbs properly fixed and the vital signs monitored.

Disinfection of the surgical area was performed. The surgical incision area and the area within 15cm from the center of the incision were disinfected. When performing the incision process in orthopedic surgery, the scope of disinfection can be appropriately expanded.

(2) Intraoperative nursing

During the surgery, nurses cooperated with doctors in the delivery of surgical supplies in a prompt and accurate manner, and paid attention to adjusting the lights, temperature, and humidity in the operating room. Nurses also monitored the vital signs of orthopedic surgery patients, and actively cooperated with doctors to complete orthopedic surgery rescue work. The specimens obtained during the operation were properly stored and submitted for examination in a timely manner. After the operation and before closing the incision, a check for any missing surgical-related items was conducted and the surgical items were recounted.

(3) Postoperative nursing

Routine postoperative intervention included wiping the blood stains on the patient's body, assisting the patient in dressing, informing the patient of the successful result of the operation, soothing the patient's emotions, transporting the patient, informing the patient of postoperative precautions, and patiently answering the patient's doubts. The patient was consulted about the operation and their opinions on operating room nursing to continuously improve operating room nursing strategies in practice and enhance service quality in the operating room.

Postoperative nursing also involved informing patients about the methods to prevent and control postoperative complications. Firstly, to prevent pressure ulcers, family members were instructed to help patients alter their limb placement to avoid long-term maintenance of the same posture, and prepare soft cushions to place on bone protruding areas, and regularly assist patients in massaging the pressure areas to stimulate local blood supply. Secondly, for the prevention of high fever, changes in body temperature after surgery were regularly monitored and prophylactic antibiotics were given to enhance the body's resistance. For patients with a body temperature higher than 38°C, the cause of high fever should be identified promptly and treated symptomatically. In order to prevent limb swelling, cold therapy was used to stimulate limbs with abnormal skin temperature, promote vasoconstriction, and increase the limb's pain tolerance threshold. Furthermore, to prevent lower limb thrombosis, the lower limbs were kept warm after surgery to avoid cold stimulation that may cause blood stasis and deep vein thrombosis. Family members were instructed to correctly massage the quadriceps muscles to promote blood supply to the affected limbs, and patients were instructed to consume low-fat diet and pay attention to skin blood supply and color changes. Moreover, for the prevention of bone cement leakage, since some patients with thoracolumbar fractures require bone cement during surgery, it is necessary to

evaluate whether bone cement has a heat accumulation effect after surgery, such as burning sensation, abdominal distension, and other symptoms, as well as evaluate whether there is bone cement leakage. For example, with the occurrence of symptoms such as nerve compression, spinal cord compression, or severe lower back pain, manual massage can be used to improve the uncomfortable symptoms while preventing the heat accumulation effect.

Group B received routine nursing, which included calming the emotions of orthopedic surgery patients before surgery; assisting orthopedic surgery patients in completing preoperative examinations and preparations and disinfecting the surgical area; monitoring vital signs during surgery and reporting any abnormalities immediately; following the doctor's instructions for medication after surgery.

2.4. Observation indicators

(1) Emotion and pain scores: Self-Rating Anxiety Scale (SAS) and Self-Rating Depression Scale (SDS) were positively correlated with anxiety and depression in orthopedic surgery patients, simultaneously. Visual Analogue Scale (VAS) was positively correlated with pain in orthopedic surgery patients.

(2) Nursing quality score: Nursing quality included service attitude, theoretical knowledge, nursing operations, nursing documents, sanitation and disinfection, health education, equipment management, environmental safety, and other dimensions, each with a score of 0–100.

(3) Quality of life score: SF-36 (36-Item Short Form Health Survey) was positively correlated with the quality of life of patients undergoing orthopedic surgery.

(4) Complications: Pressure sores, high fever, limb swelling, lower limb thrombosis, bone cement leakage, etc., were observed and recorded.

(5) Satisfaction: Assessment of a self-made orthopedic operating room nursing satisfaction scale was conducted.

2.5. Statistical analysis

The data of orthopedic surgeons were processed with SPSS21.0. Count data of orthopedic surgeons (χ^2 test) were recorded as %, the measurement data of orthopedic surgeons (t test) were recorded as mean ± standard deviation (SD). There was a statistically significant difference if $P < 0.05$.

3. Results

3.1. Emotion and pain scores

After nursing, the SAS, SDS, and VAS scores of orthopedic surgery patients in Group A were lower than those in Group B, $P < 0.05$, as shown in **Table 2**.

Table 2. Comparison of emotion and pain scores (mean ± SD)

Group	SAS (points)		SDS (points)		VAS (points)	
	Before nursing	After nursing	Before nursing	After nursing	Before nursing	After nursing
Group A (n = 31)	53.18 ± 2.41	31.44 ± 1.89	53.51 ± 2.48	31.25 ± 1.82	8.94 ± 1.56	3.25 ± 0.58
Group B (n = 31)	53.21 ± 2.39	42.29 ± 2.21	53.53 ± 2.51	43.36 ± 2.19	8.96 ± 1.58	4.88 ± 0.79
t	0.0492	20.7741	0.0316	23.6785	0.0502	9.2602
P	0.9609	0.0000	0.9749	0.0000	0.9602	0.0000

3.2. Nursing quality score

In **Table 3**, each nursing quality score in Group A was higher than that in Group B, $P < 0.05$.

Table 3. Comparison of nursing quality scores (mean ± SD)

Group	Service attitude	Theoretical knowledge	Nursing operations	Nursing documents	Sanitation and disinfection	Health education	Equipment management	Environmental safety
Group A (n = 31)	98.42 ± 2.25	98.11 ± 2.31	98.43 ± 2.38	98.25 ± 2.44	98.49 ± 2.56	97.87 ± 2.41	98.44 ± 2.39	97.68 ± 2.41
Group B (n = 31)	91.25 ± 1.49	92.71 ± 1.57	93.33 ± 1.61	92.81 ± 1.73	92.68 ± 1.88	93.43 ± 1.91	92.36 ± 1.89	93.25 ± 1.84
t	14.793 0	10.7646	9.8822	10.126 4	10.1848	8.0391	11.110 0	8.1347
P	0.0000	0.0000	0.0001	0.0000	0.0001	0.0001	0.0000	0.0001

3.3. Quality of life

After nursing, the SF-36 scores of Group A were higher than those of Group B, $P < 0.05$, as presented in **Table 4**.

Table 4. Comparison of quality of life (mean ± SD)

Group	Good health (points)		Mental health (points)		Physiological functions (points)		Social functions (points)	
	Before nursing	After nursing	Before nursing	After nursing	Before nursing	After nursing	Before nursing	After nursing
Group A (n = 31)	68.25 ± 2.11	87.36 ± 3.15	68.22 ± 2.13	88.29 ± 3.21	68.74 ± 2.18	88.36 ± 3.18	69.14 ± 2.24	88.42 ± 3.21
Group B (n = 31)	68.31 ± 2.13	76.33 ± 2.87	68.21 ± 2.15	76.41 ± 2.91	68.71 ± 2.21	75.79 ± 2.88	69.16 ± 2.26	76.11 ± 2.94
t	0.1114	14.4114	0.0184	15.2665	0.0538	16.3127	0.0350	15.7457
P	0.9117	0.0000	0.9854	0.0000	0.9573	0.0000	0.9722	0.0000

3.4. Complications

Based on **Table 5**, the postoperative complication rate of Group A was lower than that of Group B, $P < 0.05$.

Table 5. Comparison of surgical complications [n (%)]

Group	Pressure ulcer	High fever	Swelling of limbs	Deep venous blood circulation of lower limbs	Bone cement leakage	Incidence
Group A (n = 31)	0 (0.00)	0 (0.00)	1 (3.23)	0 (0.00)	0 (0.00)	3.23
Group B (n = 31)	1 (3.23)	1 (3.23)	2 (6.45)	1 (3.23)	1 (3.23)	19.35
χ^2	-	-	-	-	-	4.0260
P	-	-	-	-	-	0.0448

3.5. Nursing satisfaction

From **Table 6**, the nursing satisfaction of Group A was higher than that of Group B, $P < 0.05$.

Table 6. Comparison of nursing satisfaction [n (%)]

Group	Satisfied	Basically satisfied	Not satisfied	Total satisfaction rate
Group A (n = 31)	22 (70.97)	8 (25.81)	1 (3.23)	96.77%
Group B (n = 31)	16 (51.61)	9 (29.03)	6 (19.35)	80.65%
χ^2	-	-	-	4.0260
P	-	-	-	0.0448

4. Discussion

There are limitations in the conventional operating room nursing model, as it only manages and controls severe diseases and lacks refinement. In recent years, refined nursing models have been gradually implemented in operating rooms, particularly for orthopedic surgery patients. Various nursing strategies are standardized during the perioperative period, which fully reflects the humanistic nature of nursing, this model can reduce the risk of perioperative safety hazards and enhance nursing quality [5,6]. In addition, the refined nursing model exhibits distinctive characteristics. This approach calms the patient's emotions before surgery and assists the patient in preparing for surgery; it also includes timely delivery of surgical supplies during the surgery and strict control of nursing quality in all aspects of the surgery; active prevention of various complications after surgery and timely handling of orthopedic surgery accidents can prevent secondary infection and enhance the effectiveness of orthopedic surgery [7,8].

Based on the data analysis in this article, after refined nursing, the SAS (31.44 ± 1.89), SDS (31.25 ± 1.82), and VAS (3.25 ± 0.58) scores of orthopedic surgery patients in Group A were all lower than those in Group B, $P <$ 0.05. It is suggested that operating room refined nursing can stabilize patients' emotions and reduce postoperative pain, which is attributable to preoperative psychological counseling in soothing patients' emotions. At the same time, strengthening the management of the operating room environment and standardizing disinfection and cleaning procedures can reduce adverse events in the operating room and relieve postoperative pain [9]. In addition, the implementation of refined nursing strategies can strengthen the sense of responsibility of nursing staff in orthopedic operating rooms and enable them to proactively serve patients. The results showed that the nursing quality scores of Group A were higher than those of Group B, $P < 0.05$; the SF-36 scores of orthopedic surgery patients in Group A were higher than those of Group B, $P < 0.05$. It is suggested that operating room refined nursing can enhance the quality of nursing and improve patient's quality of life. Strengthening nurse-patient communication during operating room refined nursing can enhance the trust between medical staff and patients, ensuring the orderly progression of subsequent nursing operations. In addition, during the operating room refined nursing, aseptic operations should be implemented to prevent iatrogenic infections; surgical supplies should be checked multiple times, and disinfection and sterilization work should be conducted out to ensure surgical safety; good limb placement and complication prevention nursing should be carried out to stabilize patients' vital signs and enhance their quality of life [10]. The results also showed that the postoperative complication rate of orthopedic patients in Group A (3.23%) was lower than that in Group B (19.35%), $P < 0.05$. It is suggested that operating room refined nursing can reduce postoperative complications. Among postoperative complications of orthopedic diseases, the incidence of pressure ulcers is relatively high, which is related to long-term bed rest after orthopedic surgery. The nursing staff guides patients to position their limbs correctly and instructs family members to turn and massage patients regularly, which can effectively prevent pressure ulcers. High fever is also a common postoperative complication, which is related to low body resistance after mechanized surgery. According to medical regulations, pyrexia can be prevented by monitoring body temperature and taking medication. Limb swelling is prone to occur after orthopedic surgery. Cold therapy can be used to adjust skin temperature and stimulate the prevention of vasoconstriction. Orthopedic patients may also develop secondary deep vein thrombosis in the lower limbs, which can be prevented by massaging and keeping warm. Bone cement is used for patients with thoracolumbar spinal lesions during surgery, which may cause secondary bone cement leakage. Thus, comprehensive evaluation and treatment of patients' discomfort symptoms need to be observed [11]. The results showed that the nursing satisfaction of orthopedic surgery patients in Group A (96.77%) was higher than Group B (80.65%), $P < 0.05$. It is suggested that operating room refined nursing can improve patient satisfaction. Operating room refined nursing can enhance the professionalism of nursing staff and optimize their operating skills. At the same time, it can refine the work process and ensure the safety of operating

room work, resulting in higher patient satisfaction [12].

5. Conclusion

In summary, using operating room refined nursing during orthopedic surgery can reduce postoperative pain, soothe patients' emotions, and reduce postoperative complications. It is conducive to improving patients' quality of life after orthopedic surgery and has high clinical application and promotion value.

Disclosure statement

The author declares no conflict of interest.

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