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Original Article

Effect of refined management on the recovery of patients undergoing sinusitis surgery via nasal endoscopy

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Abstract: Objective: To explore the effect of refined management in the operation room on promoting postoperative recovery in patients undergoing sinusitis surgery via nasal endoscopy. Methods: In this retrospective study, the clinical data of 80 patients undergoing endoscopic sinus surgery were divided into study group (SG) and control group (CG) according to different nursing methods, with 40 cases in each group. The CG only received routine nursing, while the SG adopted refined management in addition to routine nursing. Postoperative pain, depression, anxiety, and nursing satisfaction were compared between the two groups. Results: There was no significant difference in Visual Analogue Scale (VAS) score between the two groups before operation (P>0.05). After operation, VAS of the SG (1.05±0.24) was significantly better than that of the CG (2.39±0.45), the nursing satisfaction rate of the SG (92.5%) was higher than that of the CG (65.0%), and the overall effective rate of nursing in the SG (95.0%) was higher than that of the CG (77.5%) (all P<0.05). The patients of SG had a lower rate of postoperative complications than CG patients (P<0.05). The operation time and postoperative recovery time of the SG were shorter than those of the CG, and the intraoperative blood loss was less than that of the CG. Smoking history, family history, dust mite allergy, pollen allergy, pet keeping, opening air conditioner use, airing of bed linen, and window ventilation were the main prognostic factors of patients with sinusitis (P<0.05). Family history, duration of immunotherapy, gender and complications were the factors affecting the prognosis of patients with sinusitis (P<0.05). The incidence of depression and anxiety in the SG were lower than those in the CG (P<0.05). The postoperative quality of life in the SG was better than that in the CG (P<0.05). Conclusion: Refined nursing can effectively alleviate pain, improve patients' satisfaction of nursing, and also significantly improve patient's depression and anxiety in endoscopic sinus surgery.

Keywords: Refinement of perioperative care, sinusitis surgery, nasal endoscopy, postoperative recovery

Introduction

Sinusitis, also called rhinosinusitis, is characterized by inflammation of the sinus mucous membranes that may cause thick nasal mucus, nasal congestion, and facial pain [1, 2]. Sinusitis may cause fever, headache, poor sense of smell, sore throat, cough, and other signs and symptoms [3]. Acute sinusitis is defined with the symptoms lasting less than 4 weeks, while chronic sinusitis is defined with the symptoms lasting more than 12 weeks [1]. Infections, allergies, and air pollution as well as structural problems in the nose, such as a deviated septum (the nose is shifted to the side) or polyps (growths) can trigger the development of sinusitis [2]. The cases are mainly induced by viral infections, and recurrent sinusitis attacks are more possibly to occur in people with asthma, compromised immune function, and cystic fibrosis [2]. Diagnostic imaging is usually not required unless complications are suspected, and for chronic cases, direct observation or CT confirmation is recommended [1].

Chronic sinusitis is accompanied by thick, usually green nasal discharge, probably containing pus or blood [4, 5]. Patients with chronic sinusitis may present with the symptoms of nasal congestion, facial pain, headache, nighttime cough, worsening symptoms of previously mild or controllable asthma, general discomfort, green or yellow thick secretions, and a feeling of facial congestion or tightness that gets worse

with bending over, dizziness, toothache and bad breath. Usually, chronic sinusitis leads to anosmia [6].

Patients with sinusitis are usually treated with endoscopic sinus surgery due to its high recurrence rate, poor response to conservative medication, and high risk of injury from traditional surgery [7]. However, this surgery is a delicate procedure, and the nasal cavity is a special site with limited operation space, which requires delicate and efficient nursing coordination to achieve better outcomes [8]. However, many factors can affect the outcome of surgery, so it is particularly important to explore the appropriate perioperative refined nursing methods. Perioperative refined nursing is a nursing method implemented on the basis of reducing communication and nursing costs, which can save medical resources to the greatest extent, and is currently widely used in the nursing of patients undergoing surgery. The establishment of a refined perioperative nursing system and process can ensure the pertinence and specialization of nursing, improve the safety of surgical treatment, and facilitate the patients' postoperative rehabilitation. The refined nursing during the perioperative period in operating room can ensure the smooth progress of the operation by formulating the refined nursing process before operation and implementing the refined nursing measures during and after operation. This nursing method has great advantages. The objective of this research was to confirm whether refinement of perioperative care in the operating room can more effectively improve the outcomes of patients with sinusitis after endoscopic sinus surgery.

Materials and methods

General data

In this retrospective study, the clinical data of 80 patients undergoing endoscopic sinus surgery from January to July 2020 in Wuzhou Gongren Hospital were grouped into two groups according to different nursing methods, with 40 cases in each group, including 23 males and 17 females in the study group (SG) with an average age of (40.1±2.7), and 21 males and 19 females in the control group (CG) with an average age of (40.8±2.8). There was no significant difference in general data between the two groups (all $P>0.05$). All study subjects had provided informed consent form, and the research was also reviewed and approved by the Medical Ethics Committee of Wuzhou Gongren Hospital.

Inclusion criteria: (1) patients who met the diagnostic criteria of sinusitis and required endoscopic sinus surgery [9]; (2) those with serious condition whose daily life was affected. Exclusion criteria: (1) those with impaired consciousness and psychiatric diseases; (2) those with severe hypertension, diabetes and heart disease who could not undergo surgery.

Methods

In the CG, routine nursing was given to patients. Different care plans were developed, and different care measures were implemented according to the different conditions and needs of patients. The specific methods are as follows: (1) Basic nursing: The body temperature was monitored and nasal cleaning was performed regularly; (2) Dietary nursing: After surgery, the patient ate easily digestible food with small and frequent meals, and was given a semi-liquid diet after one week; (3) Psychological nursing: Good communication was maintained with patients during hospitalization, patients' emotional fluctuations were observed, timely psychological guidance was provided, and patients were encouraged to socialize after discharge and restore their self-confidence; (4) Health education: Patients and their families were instructed on complication prevention and nursing, and regular telephone follow-ups were conducted after discharge.

The SG adopted refinement of perioperative care in the operating room. Refinement of management emphasizes the concept of "patient-centered" nursing service, strengthens the awareness of nursing service, advocates nurses' active service, humanized service, and strengthens hospital humanistic construction to improve patients' satisfaction. The specific methods are as follows: (1) Establishment of a refined management team: The team leader was an experienced head nurse, and the team members consisted of 3-4 nurses with professional qualifications; It also established a nursing quality system under fine management, sets up a nursing quality and safety management committee, analyzed the medical resources and patients in the department according to their situation, and clarified the nursing duties and tasks of each fine management team

member. The nursing quality and safety management committee regularly and irregularly conducted random checks and supervision of the nursing work of the team, corrected the problems in a timely manner and formulated continuous improvement programs. (2) Refinement assessment system: A quality evaluation system was established with the purpose of nursing, and all members of the team had been given relevant refinement quality management training before nursing was carried out, and the training results were assessed and entered into actual work after passing. And implement the reward and punishment system and the target management assessment were implemented in a daily routine to urge the team members to continuously improve their abilities. (3) Refined environment inspection of the operating room: Firstly, the nurse should confirm the temperature and humidity of the operating room to ensure a suitable and hygienic environment; Secondly, the ward should be prepared in advance; A surgery request form was submitted according to the time of the last surgery in the operating room, and the surgery notification form was handed over to the preparation nurse so that he or she could notify the surgical nurse to prepare for the surgery and check the information. (4) Refined preoperative guidance: Before surgery, the nurse must constantly assess the patient's condition, make corresponding adjustments at any time, and inform the family and the patients of the operation process, the necessity, the possible situation and some precautions, and give timely guidance when the patient appears nervous, anxious and other adverse emotions, as well as instruct the family to communicate more with them, enhance self-confidence and improve the degree of cooperation with the surgery. If necessary, surgical manuals can be prepared and distributed to patients and their families to guide the cleaning of the nasal cavity and the medication. (5) Refined health education: Evidence should be collected from the literature, and different levels of health education were given to patients according to their individual conditions, such as age, education level, occupational status and medical condition, and the questions from patients were answered patiently to help them better adapt to the condition. (6) Refined quality control in the operation room: The operation room equipment and environment should be checked regularly to ensure the normal operation of equipment and environmental hygiene, and the operation room nurses should also be trained regularly so that they can master constantly the updated professional knowledge and have solid expertise, and their awareness of operation room safety should also be improved to reduce surgical risks. (7) Refined discharge guidance: Patients were informed to avoid strenuous exercise and heavy physical activities after surgery, and patients and their families were educated about the method of cleaning nasal cavity and the matters that must be paid attention to after surgery. (8) Refined quality control: The problems and causes of the risks in nursing care were summarized, and the next rectification nursing plan was made based on the causes.

Outcome measurement

Postoperative satisfaction: Satisfaction was assessed by patients in terms of nursing skills and service attitudes [10], and was classified as very satisfied, satisfied, and dissatisfied. Total nursing satisfaction = (very satisfied cases + satisfied cases)/total cases × 100%.

Operation results: The operation time, postoperative recovery time, and intraoperative blood loss were counted. The shorter operation time and postoperative recovery time and the less intraoperative blood loss indicated the better nursing effect.

Postoperative pain: The Visual Analogue Scale (VAS) score [11] was applied to assess the postoperative pain of patients. VAS score: a straight line was labeled from 0-10 with even segments, corresponding to 0-10 points, and the higher score indicated the more severe pain [12]. The patients were divided into good prognosis group and poor prognosis group according to their recovery, in which those who had no postoperative complications, no bad mood, and no significant pain were included in the good prognosis group, and those who did not meet any of the above conditions were included in the poor prognosis group. The prognostic factors affecting sinusitis were analyzed by counting the smoking history, family history, dust mite allergy history, pollen allergy, pet keeping, air conditioner use, airing of bed linen, and window ventilation in both groups.

Anxiety score: Self-rating Anxiety Scale (SAS) [13] is a 20-item self-reported assessment tool, which is used to measure anxiety levels

Table 1. Comparison of baseline data (mean ± SD)/[n (%)]

Baseline data		Study group (n=40)	Control group (n=40)	t/χ^2	*P*
Gender	Male	23 (57.5%)	21 (52.5%)	4.338	0.178
	Female	17 (42.5%)	19 (47.5%)		
Age		40.1±2.7	40.8±2.8	0.710	0.480
Depression scores		74.2±9.4	74.3±9.6	1.951	0.060
Anxiety scores		65.8±3.7	65.5±3.8	0.632	0.376
Visual pain score	Before operation	9.02±0.81	9.03±0.82	0.055	0.956
	After operation	1.05±0.24	2.39±0.45	16.617	<0.001
Quality of life scores		60.65±3.42	60.3±3.50	0.325	0.745

based on the scores of cognitive, autonomic, motor and central nervous system symptoms. The cut-off value is 50, and the score above the cut-off value is considered to be prone to anxiety. The score of 50-59 is considered as mild anxiety, 60-69 as moderate anxiety, and 70 or more as severe anxiety [14].

Depression score: Self-rating Depression Scale (SDS) [15] was applied to assess depression, with lower the score representing lighter depression. The SDS [16] contains 20 items and is scored using a 5-point Likert scale, with 10 items being negative (presence of symptoms) and 10 items being positive (absence of symptoms). Positive items were scored in reverse. All items were summed to form a total score, ranging from 20 to 80. The raw score is multiplied by a factor of 1.25 to obtain the SDS index, which represents the total score [17] as a percentage; the SDS score is explained below: <50 represents the normal range, 50-59 represents mild to moderate depression, 60-69 represents moderate to severe depression, and >70 represents major depression.

Quality of life score: The SF-36 scale [18] was applied to assess the quality of life of patients. The SF-36 has 36 items in 4 areas: emotional function, cognitive function, social function, mental function, and the higher scores indicate the higher quality of life [19, 20].

Overall effective rate of nursing: No change in clinical symptoms and a decrease in the inflammation score less than 60% was regarded as ineffective; appropriate improvement in clinical symptoms and a decrease in the inflammation score by 61% to 79% was regarded as effective; complete disappearance of the clinical symptoms such as nasal congestion and runny nose, and a decrease in the inflammation score by 80% was regarded as markedly effective [21]. In this study, effective and markedly effective cases were calculated as overall effective rate of nursing.

Patient prognosis assessment: The prognosis of patients was assessed by the presence or absence of postoperative complications.

Statistical methods

SPSS19.0 statistical software was applied to analyze the data, and statistical data were analyzed by two-sided test. $P<0.05$ was considered statistically significant. Quantitative data were expressed by (mean ± standard deviation), and t-test was used for data comparison; analysis of variance (ANOVA) was used for comparison among the three groups, and least significant difference (LSD) was used for two-way comparison of all results. χ^2 test was performed for qualitative data [n (%)]. Multivariate Logistic regression was used to analyze the prognostic risk factors of sinusitis, and $\alpha=0.05$ was the test level. Graphs were produced using GraphPad Prism 8.

Results

Baseline data

The two groups exhibited no statistical differences in gender, age, and scores of depression, anxiety, visual pain, and quality of life ($P>0.05$) (**Table 1**).

Nursing satisfaction

With respect to nursing satisfaction, the SG had 30 cases of very satisfied and 7 cases of satisfied, while the CG had 17 cases of very satisfied and 9 cases of satisfied. The SG showed higher nursing satisfaction (92.5%) than the CG (65.0%) ($P<0.05$) (**Table 2**).

Table 2. Comparison of nursing satisfaction [n (%)]

Group	Number of cases	Very satisfied	Satisfied	Dissatisfied	Total satisfaction rate
Study group	40	30	7	3	37 (92.5%)
Control group	40	17	9	4	26 (65%)
χ^2	-	-	-	-	4.501
P	-	-	-	-	0.02

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

Group	Number of cases	Ineffective	Effective	Markedly effective	Nursing effective
Study group	40	2 (5%)	5 (12.5%)	33 (82.5%)	38 (95%)
Control group	40	8 (20%)	7 (17.5%)	24 (60%)	31 (77.5%)
χ^2	-	-	-	-	10.832
P	-	-	-	-	0.001

Table 4. The surgical results of the two groups

Group	Number of cases	Operation time	Post-operative recovery time	Intraoperative blood loss (mL)
Study Group	40	94.48±8.26	1.89±0.51	58.36±6.14
Control group	40	124.17±8.64	2.76±0.69	67.32±7.22
t	-	16.824	15.322	15.814
P	-	<0.001	<0.001	<0.001

Table 5. Comparison of complications between the two groups [n (%)]

Group	Number of cases	Infection	Hemorrhage	Nasal adhesions	Incidence
Study group	40	2 (5%)	2 (5%)	1 (2.5%)	5 (12.5%)
Control group	40	0	0	1 (2.5%)	1 (2.5%)
χ^2	-	-	-	-	5.957
P	-	-	-	-	0.016

Effective rate of postoperative nursing

In the SG, there were 5 effective cases and 33 markedly effective cases, and in the CG, there were 7 effective cases and 24 markedly effective cases. The SG showed higher effective rate of nursing (95.0%) than the CG (77.5%) (*P*< 0.05) (**Table 3**).

Comparison of surgical outcomes

The SG showed shorter operation time and postoperative recovery time, and less intraoperative blood loss than the CG (*P*<0.05) (**Table 4**).

Comparison of prognosis

The SG had 2 cases of infection, 2 cases of hemorrhage, and 1 case of nasal adhesions, while the CG had only 1 case of nasal adhesions. The incidence of complications in the SG (12.5%) was higher than that in the CG (2.5%) (P<0.05) (**Table 5**).

Prognostic factors of sinusitis

Smoking history, family history, dust mite allergy, pollen allergy, pet keeping, air conditioner use, airing of bed linen, and window ventilation were the main prognostic factors of patients with sinusitis (*P*<0.05) (**Table 6**).

Multivariate analysis of prognosis of patients with sinusitis

Family history, duration of immunotherapy, gender and complications were the independent factors affecting the prognosis of patients with sinusitis (*P*<0.05) (**Table 7**).

Comparison of VAS scores

There was no significant difference in VAS score between the two groups before operation (*P*>

Table 6. Prognostic factors of sinusitis

Factors		Good prognosis group (n=74)	Poor prognosis group (n=6)	X^2	*P*
Smoking history	>5 sigarettes/day	26	5	6.067	0.034
	other	31	4		
Family history	Yes	15	4	5.846	0.024
	No	37	5		
History of dust mite allergy	Yes	16	3	5.063	0.046
	No	32	3		
Pollen allergy	Yes	10	2	4.008	0.037
	No	36	3		
Pets	Yes	18	1	5.076	0.018
	No	31	4		
Air conditioner use	Often	17	3	4.256	0.039
	Seldom	35	5		
Airing of bed linen	Often	16	2	5.456	0.029
	Seldom	33	5		
Window ventilation	Often	12	4	6.067	0.025
	Seldom	35	4		

Table 7. Multivariate analysis of prognostic factors of patients with sinusitis

Factors	β	S.E	Wald X^2	*P*	OR (95% *CI*)
Family history	-0.174	0.177	0.635	0.034	-0.177 (-0.456~-0.313)
Duration of immunotherapy	-0.078	0.051	2.467	0.046	0.334 (-0.035~0.645)
Gender	0.377	0.186	4.652	0.022	0.406 (0.044~0.828)
Complications	0.014	0.084	0.328	0.047	-0.252 (-0.078~0.635)

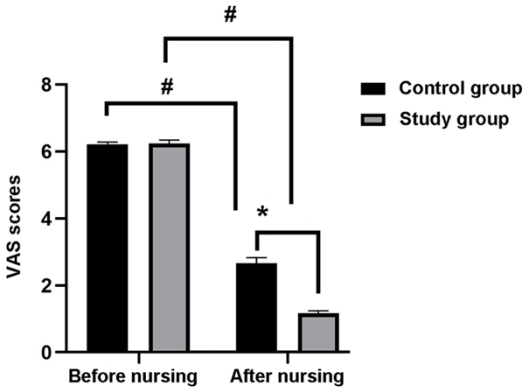

Figure 1. Visual pain scores. After nursing, the VAS scores of the study group (1.05±0.24) were lower than those of the control group (2.39±0.45). Compared with before nursing, $^{\#}P<0.05$; compared with control group after nursing, $^{*}P<0.05$. Visual Analogue Scale (VAS).

0.05). After nursing, the overall VAS score of the SG was (1.05±0.24), and that of the CG was (2.39±0.45) (*P*<0.05), and the SG exhibited lower VAS scores than the CG (*P*<0.05) (**Figure 1**).

Depression scores and anxiety scores

After nursing, the SDS score and SAS score were (45.2±1.2) and (40.5±4.7), respectively in the SG, and (51.7±4.1) and (45.2±1.2), respectively in the CG, which showed a statistically marked difference (*P*<0.05) (**Figure 2**).

Quality of life scores

After nursing, the scores of emotional function, mental function, cognitive function, and social function were higher in the SG than in the CG; the overall postoperative quality of life score was (90.64±5.65) in the SG and (76.67±2.43) in the CG, showing marked difference (*P*<0.05) (**Figure 3**).

Discussion

Refinement management first originated in enterprise management that focused on details in the process of work, so as to effectively improve the efficiency and obtain maximum gains with minimum consumption [4]. The refined nursing

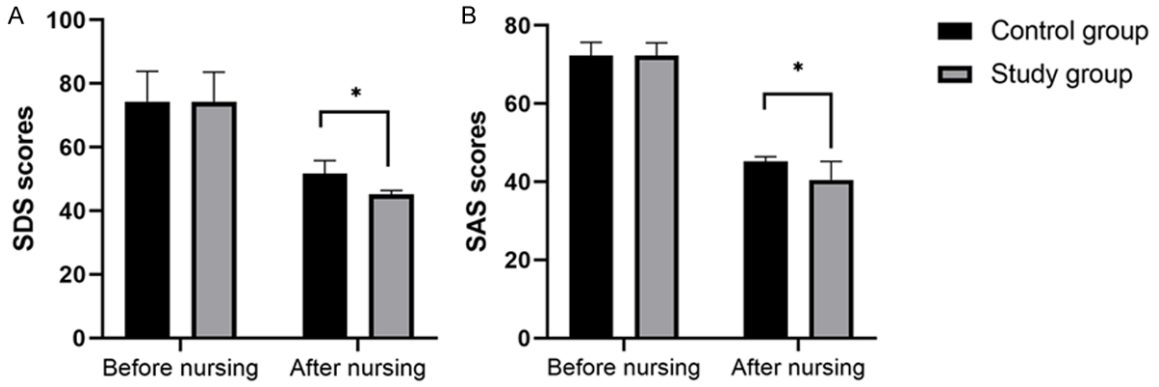

Figure 2. Comparison of SDS and SAS scores. A: Self-rating Depression Scale (SDS); B: Self-rating Anxiety Scale (SAS). After nursing, the SDS and SAS scores of the study group were better than those of the control group (P<0.05). *P<0.05.

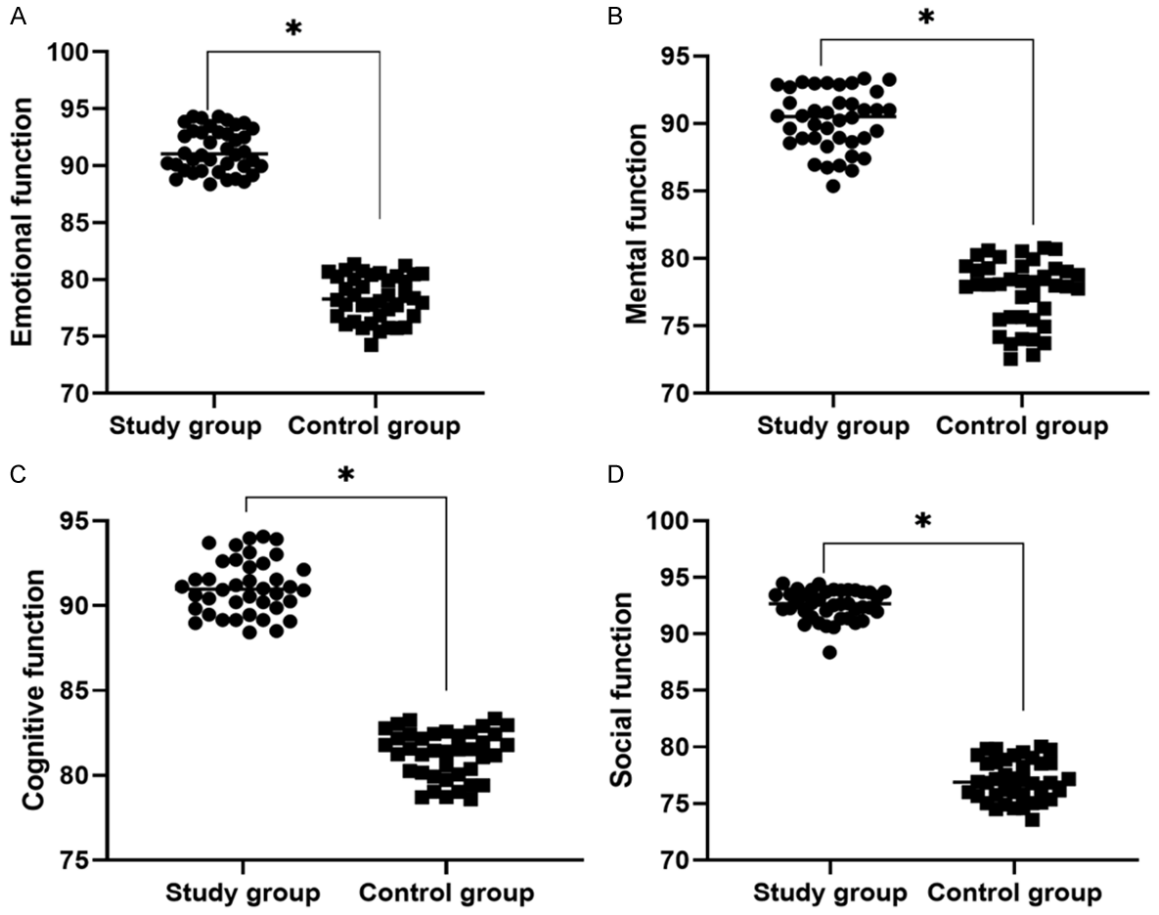

Figure 3. Quality of life scores. A: Emotional function; B: Mental function; C: Cognitive function; D: Social function. After nursing, each dimension score of quality of life of the study group were better than those of the control group (P<0.05). *P<0.05.

interventions highlight the careful, meticulous and rigorous attitude in the nursing process. Research has shown that refined nursing improves nursing effects by improving the nursing concept and enhancing the training of nursing staff [22]. The concept of refined nursing is

patient-centered and guided by modern nursing management, which standardizes the nursing measures to make the nursing work more rigorous and effective and make the nursing more humanized in the operating room [23].

There are many surgeries every day with different conditions, so the nursing work is heavy and risky. Nursing staff face a rapid pace of work and great psychological pressure, so professional nursing staff is the key to ensure that all work in the operation room is carried out smoothly and improve the surgical outcomes of patients [24, 25]. It was found that a large proportion of medical errors were caused by inappropriate management and only a small proportion by improper operations, so it is important to refine the management of the operation room, not only to improve the postoperative outcome of patients, but also to enhance the overall management of the hospital [26].

In this study, the patient's satisfaction in the SG was significantly improved after refined nursing in the operation room, indicating that refined nursing in the operating room plays a vital role in the surgical process, and the postoperative nursing effect of the SG was significantly superior to that of the CG. A previous study reported that the refined nursing in the operating room not only effectively promoted the postoperative recovery of patients, but also greatly improved the satisfaction of patients [27], which was similar to the findings of this study.

The results of this study revealed that the symptoms of depression and anxiety of patients were effectively improved after the refined nursing. It was reported that the refined nursing model effectively improved the depression and anxiety as well as the quality of life of patients [28], which was similar to the findings of this study. Moreover, the results of this study indicated that the refined nursing in the operating room of the SG effectively reduced the postoperative pain level, which is in line with the results of Demoly et al. [29]. Smoking history, family history, dust mite allergy, pollen allergy, pet keeping, air conditioner use, airing of bed linen, window ventilation were the main prognostic factors of patients with sinusitis, and family history, duration of immunotherapy, gender, and complications were the in depended factors affecting the prognosis of patients with sinusitis. In brief, the pathogenesis of rhinitis is complex, and the results of this study can be used as a reference for the treatment of patients.

In conclusion, refined nursing model in endoscopic sinus surgery can effectively alleviate pain, improve satisfaction of nursing, and also significantly improve patient's depression and anxiety, which has certain application value. Family history, duration of immunotherapy, gender and complications were the independent factors affecting the prognosis of patients with sinusitis. However, this study also has certain shortcomings. The sample size is small, and there is no analysis of the factors influencing the effect of nursing model, which should be explored in the future research.

Disclosure of conflict of interest

None.

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