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Review Article

Effects of synthesis nursing on perioperative nursing and quality of life of patients with tonsillitis

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Abstract: This study aimed to explore the effects of synthesis nursing on the curative effect and quality of life of tonsillitis patients during perioperative nursing. Altogether 189 cases of tonsillitis patients admitted to our hospital were collected as research subjects. Among them, 102 patients received treatment with synthesis nursing who were included in the research group (RG). The other 87 patients received only routine nursing and were enrolled in control group (CG). The curative effect, improvement of symptoms, the level of C-reactive protein and white blood cell count before and after treatment, occurrence of adverse reactions, nursing satisfaction, VAS pain, length of hospital stay and quality of life of the patients in the two groups were observed. Overall; the effective treatment rate of the RG was higher than that of the CG ($P<0.05$). The improvement of symptoms in the RG was better than that of the CG ($P<0.05$). After treatment, the levels of C-reactive protein and white blood cell count in the RG were significantly lower than that of the CG ($P<0.05$), the total incidence of adverse reactions in the RG was notably lower than that of the CG ($P<0.05$), and the nursing satisfaction of the RG was higher than that of the CG ($P<0.05$). Moreover, the VAS pain score of the RG was remarkably lower than that of the CG ($P<0.05$), the length of hospital stay of the RG was notably shorter than that of the CG ($P<0.05$), and the quality of life of the patients in the RG was remarkably better than that of the CG ($P<0.05$). Synthesis nursing intervention can effectively improve the perioperative clinical efficacy of tonsillitis patients and improve their quality of life, which has great clinical application value.

Keywords: Synthesis nursing, tonsillitis, clinical efficacy, quality of life

Introduction

Tonsillitis is a common infectious disease in the otorhinolaryngological department [1]. It can be divided into acute tonsillitis and chronic tonsillitis. It mostly occurs in adolescents [2]. Chronic tonsillitis is caused by viruses and bacteria remaining in the crypt palatine tonsil, and repeated infection [3]. The clinical symptoms are mostly foreign body sensation, pharyngeal itching, halitosis, tonsils redness and swelling time, etc. Patients often have irritating cough due to pharyngeal discomfort, which can affect daily life [4]. However, acute tonsillitis is mostly caused by bacteria or viruses [5]. Its clinical manifestations include lassitude, constipation, general malaise, high fever, headache, fear of cold, and decreased appetite and dysphagia [6]. Acute tonsillitis easily relapses, and the disease has many complications, such as rheumatic fever, acute nephritis, acute arthritis, myocarditis, peritonsillar abscess, parapharyngeal abscess, etc., which have a serious impact on patients' health [7]. Tonsillitis, is an extremely common disease seen in the clinic; is not difficult to treat, but is prone to recurrent risks [8]. Therefore, the complete eradication of tonsillitis by tonsillectomy is also a common method in clinic [9]. At present, tonsillectomy is widely used in clinical practice, but the following surgical risks are also increasing (e.g. postoperative hemorrhage and infection, etc.) [10]. Therefore, in order to effectively improve the application of tonsillectomy, seeking effective intervention is a major research focus in clinical practice.

Recently, increasing studies have pointed out that the intervention of nursing methods has a significant effect on the improvement of surgical results [11]. For example, the team of Refai et al [12] suggested that a positive nursing plan had the advantages of reducing the potential

complications and shortening the length of stay after thoracic surgery. Synthesis nursing intervention is a kind of nursing modality widely used in clinical practice in recent years, which carries out in-depth and targeted meticulous nursing plans regarding mentality, physiology, diet and exercise, postoperative rehabilitation and other aspects; so as to better meet patients' needs during perioperative period [13]. At present, it has been proven to have extremely high application value in various tumor diseases [14], and has been applied more and more widely in clinical practice. Some studies suggest that synthesis nursing intervention can effectively improve the therapeutic effect of minimally invasive surgery on hypertensive cerebral hemorrhage [15]. However, there is still much controversy about the perioperative nursing intervention for tonsillitis surgery. Hence, this research aims at providing a reliable theoretical foundation for future clinical treatment of tonsillitis patients by exploring the application value of synthesis nursing intervention for tonsillitis surgery.

Materials and methods

General data

A total of 189 cases of tonsillitis patients admitted to First Affiliated Hospital of Soochow University from April 2016 to October 2018 were chosen to be study subjects. Among them, 102 patients received treatment of synthesis nursing and were enrolled in the research group (RG). Another other 87 patients received only routine nursing during hospitalization and were enrolled in control group (CG). This study was conducted with the approval of the ethical committee of First Affiliated Hospital of Soochow University, and all study subjects above have signed an informed consent.

Inclusion and exclusion criteria

Inclusion criteria: All patients were diagnosed with tonsillitis in our hospital [16] and underwent surgical treatment in our hospital [17] after diagnosis. Patients had complete case data and agreed to cooperate with the medical staff of our hospital. Patients themselves or their immediate family members signed the informed consent.

Exclusion criteria: Patients with other malignant tumors; Patients complicated with multiple chronic diseases; Patients with other cardiovascular and cerebrovascular diseases; Patients with organ dysfunction; Patients with drug allergy; Patients with mental diseases or physical disabilities who could take care of themselves; Patients with surgical taboos; and Patients transferred to other hospitals.

Methods

Basic preoperative preparations were conducted in both groups of patients, their physiological indicators were observed, and general anesthesia was adopted. The surgery was performed by the same team of doctors. Patients in both groups received hemostasis and an ice compress after surgery, anti-infection treatment, and nursing care at the same time.

Routine nursing was performed in the CG, including hospital environment guidance, ward environment nursing, health education on disease-related knowledge for patients' parents, medication methods and dose guidance, instruction on the importance of rest, attention and guidance, and diet care, etc.

Synthesis nursing was applied to the RG in addition to treatment of the CG. First of all, preoperative nursing was carried out to strengthen communication with patients and reduce their negative emotions such as anxiety and tension caused by an unfamiliar environment. Nursing staff were insturcted to inform patients and their families about the disease in detail so as to improve the treatment compliance of patients and their families. Electrocardiogram, routine blood work, chest X-ray and biochemical indexes of liver and kidney function were routinely checked before the operation. Normal saline was used to rinse the mouth before operation. Fasting was started 6 hours before the operation, and drinking was forbidden 4 hours before the operation. Postoperative care was then performed. Nursing staff were assigned to help patients adjust their body positions to ensure comfort. If patients did not wake up from anesthesia, they adjusted patients' into a supine position, and position the head to avoid secretions blocking the oral cavity and respiratory tract. Patients were given regular oxygen via mask inhalation with the parameters set to 5 L/min. Vital signs were monitored and equipment such as a light plug, sputum aspirator and tongue depressor were prepared at the bed-

Table 1. Curative effect evaluation

Recovered	Symptoms (throat itching, red and swollen, etc.) disappear, body temperature recovers, and white blood cell count is normal for recovery.
Markedly effective	Symptoms (throat itching, red and swollen, etc.) are significantly alleviated, body temperature is recovered, and white blood cell count is normal to be markedly effective.
Effective	Symptoms (throat itching, red and swollen, etc.) are alleviated, body temperature is recovered, and white blood cell count is decreased to be effective.
Ineffective	Failure to meet the above criteria is ineffective.

Table 2. General data

	RG (n=102)	CG (n=87)	t or χ^2	P
Age (years)	22.3±6.6	23.2±7.5	0.878	0.381
BMI (KG/cm^2)	22.52±3.05	22.46±4.72	0.105	0.916
Living environment			2.738	0.098
Town	79 (77.45)	58 (66.67)		
Countryside	23 (22.55)	29 (33.33)		
Educational level			0.070	0.791
< high school	71 (69.61)	59 (67.82)		
≥ high school	31 (30.39)	28 (32.18)		
Smoking history			1.208	0.272
With	18 (17.65)	21 (24.14)		
Without	84 (82.35)	66 (75.86)		
Drinking history			1.624	0.203
With	16 (15.69)	20 (22.99)		
Without	86 (84.31)	67 (77.01)		
Family medical history			0.451	0.502
With	40 (39.22)	30 (34.48)		
Without	62 (60.78)	57 (65.52)		
Nation			0.876	0.349
Han	82 (80.39)	65 (74.71)		
Minority	20 (19.61)	22 (25.29)		
Red blood cell (×10^{12}/L)	4.85±0.52	4.73±0.43	1.711	0.089
Platelet (×10^9/L)	246.52±46.21	237.23±43.26	1.418	0.158

Table 3. Comparison of clinical efficacy between the two groups [n (%)]

	RG (n=102)	CG (n=87)	χ^2	P
Recovered	78 (72.22)	54 (62.07)		
Markedly effective	15 (14.71)	20 (22.99)		
Effective	8 (7.84)	7 (8.05)		
Ineffective	1 (0.98)	6 (6.90)		
Total effective rate	99.02	93.10	4.608	0.032

side for standby. The bleeding of patients was closely monitored and handled in time. Regular disinfection and cleaning of wards was performed, ward temperature and humidity were strict controlled. Patients and their families were guided to eat liquid food, and non-recomended food was informed about in detail. Patients were guided to avoid complications, and the postoperative situation of patients was strictly monitored to avoid infection. If a high risk of infection was found, the nursing staff gave the patients anti-infection treatment. Twenty-four hours after the operation, nursing staff gave a 0.9% sodium chloride solution to the patients to gargle with. One day after the operation, the nursing staff guided the patients to perform functional exercises, including mouth opening and tongue extension, chewing gum, etc., to avoid incision adhesion.

Outcome measures

Main outcome measures: Curative effect of patients in the two groups were observed [18]. As shown in **Table 1**. The improvement of symptoms, adverse reactions, and the nursing satisfaction of patients in the two groups was compared, and the quality of life of patients in the two groups was observed. The time of pharyngeal discomfort, fever resolution, tonsil redness and swelling, as well as the incidence of incision infection, incision adhesion, dysphagia, allergy, nausea and vomiting, pseudomembranous colitis and other adverse reactions in the two groups were calculated. The nursing satisfaction of patients in the two groups was compared [the nursing satisfaction was carried out by questionnaire sur-

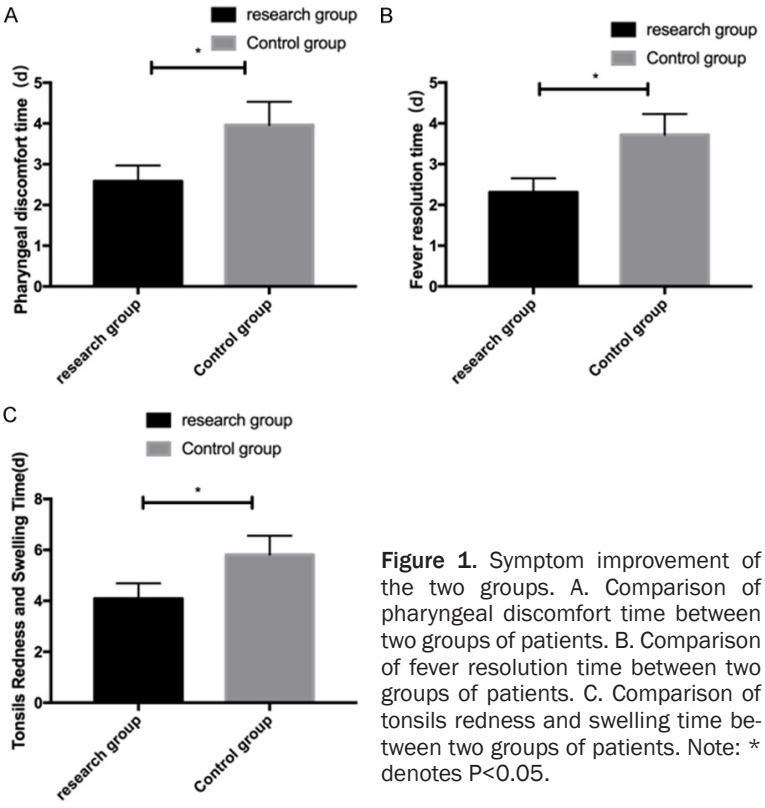

Figure 1. Symptom improvement of the two groups. A. Comparison of pharyngeal discomfort time between two groups of patients. B. Comparison of fever resolution time between two groups of patients. C. Comparison of tonsils redness and swelling time between two groups of patients. Note: * denotes P<0.05.

vey with a total score of 100, with scores ranging from 0 to 59 indicating dissatisfaction, scores ranging from 60 to 90 indicating satisfaction, and scores ranging from 90 to 100 indicating great satisfaction]. The quality of life of the patients in the two groups was observed [with reference to general quality of life inventory].

Secondary outcome measures: C-reactive protein level and white blood cell count before and after treatment were observed [automatic biochemical analyzer was used for C-reactive protein detection, and automatic blood cell analyzer was used for white blood cell count]. A digital scoring tool was applied to explain the pain criteria to patients, and VAS pain and length of stay between the two groups were compared.

Statistical methods

Analysis of the data was conducted by the aid of SPSS 22.0 statistical software, and Graphpad7 software was used to illustrate the data. The enumeration data were expressed as rate. Chi-square test was utilized for inter-group comparison. The measurement data were expressed as (mean ± standard deviation), and t test was applied for inter-group comparison. When P<0.05, there was a statistically significant difference.

Results

Comparison of general data

There was no difference in age, BMI, living environment, education level, smoking history, drinking history, family medical history, nationality, red blood cell count and platelets between the two groups (P>0.05). As shown in **Table 2**.

Comparison of clinical efficacy

In the RG, 72.22% (78 cases) recovered well, 14.71% (15 cases) were markedly effective, 7.84% (8 cases) were effective, and 0.98% (1 case) was ineffective; with an overall effective treatment rate of 99.02%. In the CG, 62.07% (54 cases) were cured, 22.99% (20 cases) were markedly effective, 8.05% (7 cases) were effective, and 6.90% (6 cases) were ineffective; with an overall effective treatment rate of 93.10%. The effective treatment rate of the two groups was compared, and it could be seen that it was higher in the RG than that of the CG, with statistical difference (P=0.032). See **Table 3**.

Symptom improvement of the two groups

The improvement of symptoms in both groups was observed. The results indicated that the pharyngeal discomfort time, fever resolution time and tonsils redness and swelling time in the RG were lower than those in the CG, with a statistically significant difference (P<0.05). As shown in **Figure 1**.

C-reactive protein level and white blood cell count before and after treatment in the two groups

After observing the C-reactive protein level and white blood cell count of patients in both groups before and after treatment, it could be seen that there was no statistically significant differ-

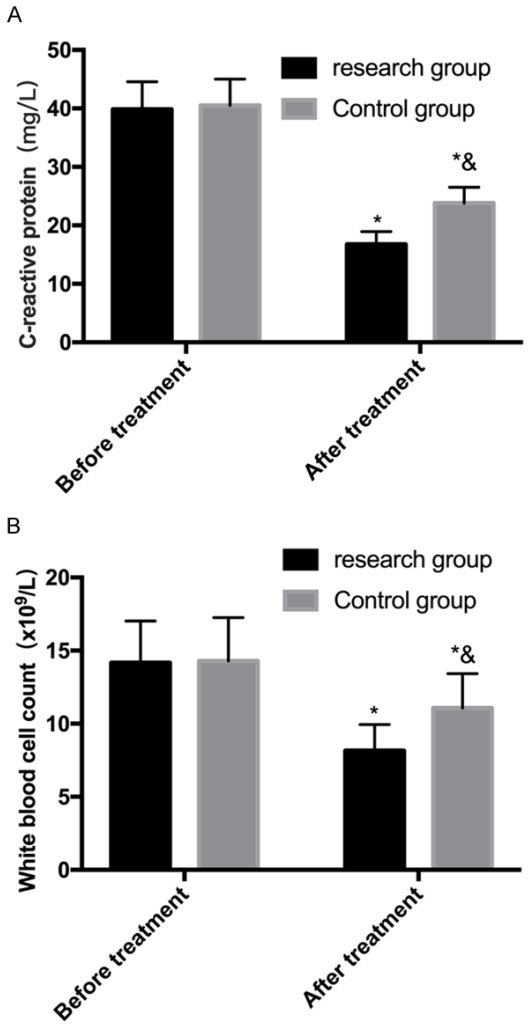

Figure 2. Levels of C-reactive protein and white blood cell count before and after treatment in the two groups. A. Comparison of C-reactive protein levels before and after treatment between the two groups. B. Comparison of white blood cell counts between the two groups before and after treatment. Notes: * denotes comparison with before treatment, & denotes comparison with the RG.

ence between the two metrics in the two groups before treatment (P>0.05). After treatment, the two metrics in the both groups were lower than those before treatment, and that the RG was considerably lower than in the CG (P<0.05), as shown in **Figure 2**.

Adverse reactions in the two groups

By comparing the total incidence of adverse reactions between the two groups, it was found that the total incidence of adverse reactions in the RG was 2.94%, and that in the CG was 11.49%. The total incidence of adverse reactions in the RG was remarkably lower than that in the CG, with a statistically significant difference (P<0.05). As shown in **Table 4**.

Comparison of nursing satisfaction

There was no significant difference in the number of dissatisfied patients between the two groups (P=0.05). The number of patients with great satisfaction in the RG was significantly higher than that of the CG (P<0.05), number of patients with satisfaction in the RG was lower than that of the CG (P<0.05), and the number of people needing improvement in the RG was considerably lower than that of the CG (P<0.05). As shown in **Table 5**.

Comparison of VAS pain between the two groups

There was no significant difference in VAS score between the two groups before treatment (P>0.05). VAS score in the RG was (2.43±1.25) after treatment, which was remarkably lower than that in the CG (3.72±1.37), P<0.05. As shown in **Figure 3**.

Comparison of length of hospital stay

Length of hospital stay of patients in both groups was observed, the results revealed that the length of hospital stay in the RG was considerably shorter than that of the CG, and the difference was statistically significant (P<0.05). As shown in **Figure 4**.

Comparison of quality of life

After observing the quality of life of the two groups of patients after nursing, it could be seen that the scores of physical function, role physical, emotional function, cognitive function, social function and other dimensions of the quality of life in the RG after nursing were remarkably better than those of the CG (P<0.05). As shown in **Table 6**.

Discussion

Tonsillitis is an infectious disease, mostly due to repeated attacks and delayed healing or chronicity of acute tonsillitis, which develops into chronic tonsillitis [19]. At present, tonsillitis is often treated by surgery in the clinic [20]. However, due to the rich distribution of nerves and blood vessels around the human tonsils,

Table 4. Comparison of adverse reactions between the two groups [n (%)]

	RG (n=102)	CG (n=87)	χ^2	P
Incision infection	1 (0.98)	2 (2.30)		
Incision adhesion	0 (0.00)	1 (1.15)		
Dysphagia	1 (0.98)	2 (2.30)		
Allergy	0 (0.00)	2 (2.30)		
Nausea and vomiting	1 (0.98)	2 (2.30)		
Pseudomembranous colitis	0 (0.00)	1 (1.15)		
Adverse reaction rate (%)	2.94	11.49	5.363	0.021

Table 5. Comparison of nursing satisfaction between the two groups

	RG (n=102)	CG (n=87)	χ^2	P
Great satisfaction	84 (82.35)	31 (35.63)	43.02	<0.001
Satisfaction	10 (9.80)	36 (41.38)	25.42	<0.001
Need to be improved	6 (5.88)	13 (14.94)	4.262	0.039
Dissatisfied	2 (1.96)	7 (8.05)	3.834	0.050

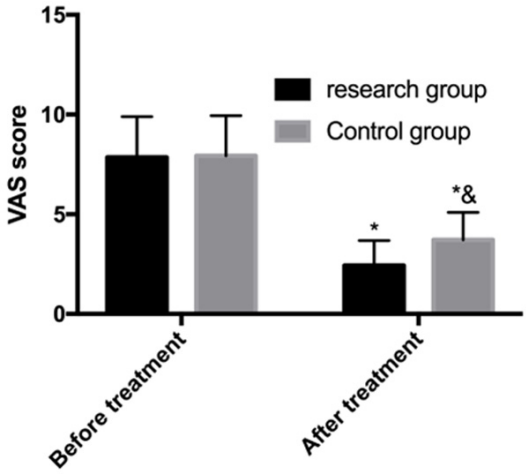

Figure 3. Comparison of pain between two groups of patients. Note: * denotes comparison with before treatment, P<0.05. & denotes comparison with the RG, P<0.05.

tonsillitis patients after surgical treatment often have more complications due to infection [21]. Synthesis nursing is a popular new nursing mode, which is a personalized nursing service mode established from the perspectives of patients' society, physiology and psychology [22]. In this study, we applied synthesis nursing to the postoperative recovery of tonsillitis patients, to observe its application value to postoperative tonsillitis patients, and to provide help to reduce resource waste and speed up recovery for clinical treatment of tonsillitis patients.

The results of this experiment indicated that the clinical efficacy of the patients in the RG with applied synthesis nursing intervention was notably better than that of the patients in the CG with routine nursing intervention. The patients in the RG treated with synthesis nursing intervention had significantly shorter pharyngeal discomfort time, fever resolution time and tonsils redness and swelling time than those in the CG receiving treatment of routine nursing intervention. The levels of C-reactive protein and white blood cell count were significantly reduced, and the incidence of adverse reactions in the patients in the RG treated with synthesis nursing intervention was considerably reduced. Tonsillitis is caused by viruses and bacteria remaining in the palatine tonsil crypts and repeated infections. Therefore, the key to clinical treatment lies in anti-infection. C-reactive protein is an acute phase protein, and its detection can effectively determine the source of infection in the body, providing a basis for the diagnosis and treatment of diseases. White blood cells are a very important type of blood cell in the human body. When the body is sick, it often results in significant changes in the number of white blood cells. This can directly reflect the level of inflammation after infection. Therefore, this result suggests that comprehensive nursing intervention can improve the efficacy of tonsillectomy, greatly reduce the symptoms of patients, reduce the inflammatory level of patients, and effectively improve the adverse reactions of tonsillitis patients during the perioperative period. This is also consistent with the effect of synthesis nursing intervention mentioned in previous studies [23]. For example, the research of Olsson Moller and his teams [24] shows that synthesis nursing is of great significance for psychological adjustment after surgical treatment of female breast cancer. However, Lau et al [25] said that synthesis nursing intervention has a better clinical effect in preventing gastrointestinal surgical incision infection. All of them support the results of this experiment. After investigation, the satisfaction

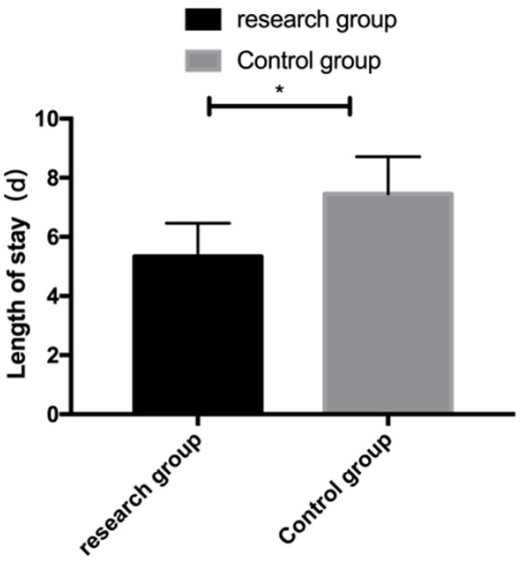

Figure 4. Comparison of length of hospital stay. * denotes P<0.05.

degree of patients with synthesis nursing care was notably better than that of routine nursing, which further supports our above-mentioned experiments, suggesting that synthesis nursing intervention may have important significance for perioperative nursing care of tonsillitis patients. Synthesis nursing is a holistic, creative and personalized nursing model that requires the strengthening of professional skills of caregivers and the need for a comprehensive and targeted service for caregivers [26]. We speculate that its value is mainly reflected in the following aspects: 1. Improvement in pain. Tonsillitis, as a common infectious disease, that greatly hinders patients' breathing and swallowing. Surgery is one of the necessary treatment methods, and surgery is an invasive operation, which not only causes greater trauma and pain to patients, but also may cause oxidative stress injury pain in the internal environment after surgery [27]. As the anesthetic wears off, the patient's pain increases. Synthesis nursing effectively reduces the pain of patients and improves the nursing effect through rehabilitation training guidance and more detailed nursing services for patients. This experiment also compared the VAS scores of patients in the two groups, and the results showed the same. 2. Short length of hospital stay. Through synthesis nursing intervention, which give meticulous and targeted nursing services, we have greatly improved the surgical efficacy of patients, reduced adverse reactions of patients after surgery, alleviated postoperative pain, accelerated the recovery of patients' postoperative body functions, reduced adverse effects during the perioperative period from all aspects, and enlarged the treatment advantages. Therefore, when we investigated the length of hospital stay time of patients, we found that patients' length of hospital stay when applying synthesis nursing was obviously shortened. 3. Comparison of quality of life. Tonsillitis is more likely to occur in adolescents. Due to the unknown nature of the disease and its adverse effects on patients, such as pharyngeal pain, dysphagia, laryngitis, pharyngitis, and general fatigue, it seriously threatens patients' physical and mental health, quality of life, and causes severe negative emotions [28]. Through the above intervention, the treatment of patients will achieve better results and is more favorable for their prognosis. We further investigated the prognosis quality of life of the two groups of patients and found that the quality of life of the patients in the RG was remarkably better than that in the CG, which also confirmed our above conjecture, proving that the application value of synthesis nursing.

The purpose of this experiment was to investigate the application value of synthesis nursing in the perioperative period of tonsillitis. Due to the limited experimental conditions, however, there are still deficiencies. For example, due to multiple nursing methods in clinical practice, there is still great controversy over the best choice of nursing mode for tonsillitis. This study only measured routine nursing as a control, it is not excluded that the application of synthesis nursing intervention may differ in results when compared with other nursing modes. Moreover, no corresponding treatment has been carried out for tonsillitis patients with different degrees of illness in this study, which still requires further experimental analysis. We will expand the sample size of the study as soon as possible, extend the experimental period, and conduct more detailed and comprehensive experimental analysis to obtain more perfect experimental results.

Conclusion

Synthesis nursing intervention can effectively improve the therapeutic effect of tonsillitis patients during the perioperative period, im-

Table 6. Comparison of quality of life between two groups

	RG (n=102)	CG (n=87)	t value	*P* value
Physical function	94.32±4.35	86.44±4.26	12.530	<0.001
Role physical	82.67±3.48	68.22±3.17	29.640	<0.001
Emotional function	88.53±3.15	72.64±3.45	33.080	<0.001
Cognitive function	92.59±3.78	83.57±3.62	16.670	<0.001
Social function	63.21±4.12	53.73±3.65	16.610	<0.001

prove the quality of life of patients, and has great clinical application value.

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Disclosure of conflict of interest

None.

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