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Original Article

Effects of comfort nursing on pain and quality of life in children undergoing tonsillectomy

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Abstract: Objective: To observe the effect of comfort nursing on pain, quality of life, and nutritional status in children undergoing tonsillectomy. Methods: In this retrospective study, a total of 114 children who underwent tonsillectomy in Chun'an Hospital of Traditional Chinese Medicine were divided into a research group and a control group according to the nursing methods, with 57 cases in each group. The control group received routine nursing care, and the research group received additional comfort nursing. We compared the pain level (assessed by visual analogue scale (VAS) scale), quality of life (assessed by Generic Quality of Life Inventory-74 (GQOLI-74)), relevant clinical indicators (postoperative swallowing recovery time, wake-up time, and hospital stay), nutrition indicators (total blood protein and albumin), sleep quality (assessed by Pittsburgh Sleep Quality Index (PAQI)), nursing satisfaction, and postoperative complications between the two groups. Results: After postoperative nursing, the VAS scores and PSQI scores were significantly decreased (both $P<0.05$), and the GQOLI-74 scores were significantly increased ($P<0.05$) in both groups. The postoperative swallowing recovery time, wake-up time, and hospital stay in the research group were significantly shorter than those in the control group (all $P<0.05$). The levels of total serum protein and albumin in the research group were significantly higher than those in the control group (both $P<0.05$). The research group showed a significantly higher satisfaction rate and lower incidence of complications as compared with the control group (both $P<0.05$). The results of the logistic regression analysis showed that postoperative upper respiratory infection and the degree of tonsillar embedment were independent risk factors for hemorrhage after tonsillectomy ($P<0.05$). Conclusion: In children undergoing tonsillectomy, providing comfort nursing can significantly reduce pain and improve their quality of life.

Keywords: Comfort nursing, tonsillectomy, pain, quality of life

Introduction

Pediatric tonsillectomy is a common surgery for chronic tonsillitis, and adenoid hypertrophy [1, 2]. The tonsils are located inside the mouth. There are many nerves and blood vessels in the adjacent area. Tonsillectomy causes complications such as pain in the operation area, and affects the children's diet, life, communication, or the psychological state in severe cases [3]. This surgery can impose on the mental health of children, and reduce the sleep quality, hindering the postoperative recovery and influences the treatment efficacy. Scientific and reasonable nursing measures should be conducted to improve the treatment efficacy [4, 5]. Children undergoing tonsillectomy are prone to pain in the operation area. Traditional nursing provides simple pain relief according to the doctor's advice, rarely focusing on the general physical and mental health of the children. Comfort nursing enhances the mental and physical plea-

sure, helping them to be in a positive physical and mental state and better cooperation with treatment, contributing to the recovery of the disease [6, 7].

The concept of comfort nursing is child-centered from multiple perspectives during the treatment [8]. This nursing mode has been carried out in various departments such as internal medicine, obstetrics, and orthopedics, and has shown good efficacy. A study of 96 children who underwent laparoscopic surgery showed that the nursing efficacy and satisfaction rate after postoperative comfort nursing were higher than those in the control group. Children who received comfort nursing adopted self-regulation to actively improve their negative emotions and cope with the surgery with a positive attitude [9]. It has been shown that comfort nursing for children undergoing bronchoscopy (n= 47) significantly improved the compliance of the children, shortened the examination time, and relieved their pain [10]. There are few clinical reports about the effects of comfort nursing on the pain, quality of life, nutritional status, and sleep quality in children undergoing tonsillectomy. This study aimed to observe the effect of comfort nursing on the pain, nutrition, and sleep quality of children undergoing tonsillectomy, to compare the effect of comfort nursing with that of conventional nursing.

Materials and methods

Baseline data

In this retrospective analysis, 114 children who underwent tonsillectomy in Chun'an Hospital of Traditional Chinese Medicine from January 2021 to January 2022 were included. The children were divided into a research group and a control group according to the nursing methods, with 57 children in each group. This study was approved by the Ethics Committee of Chun'an Hospital of Traditional Chinese Medicine (LS2022Y-005).

Inclusion criteria: (1) children who were aged 5-13 years old; (2) children who received tonsillectomy under general anesthesia; (3) children without contraindications to the study procedures; (4) children with complete clinical data.

Exclusion criteria: (1) those with allergic diseases; (2) those with cognitive dysfunctions, mental disorders, or communication disability; (3) those with poor compliance; (4) those who participated in other research projects; (5) those with malignant tumors; (6) those with recent use of analgesics or sedatives.

Methods

The children in both groups were anesthetized with dexmedetomidine hydrochloride injection (Jiangsu Hengrui Pharmaceutical Co., LTD., lot number: 20090248) during the operation. Oral ibuprofen (Changzhou Pharmaceutical Factory Co., LTD., lot number: 10970354) was provided after the operation to relief pain.

In the control group, routine nursing measures were carried out [11]. Detailed medical histories were inquired. Careful preoperative preparations (routine blood test, blood clotting check, anesthetic dose, and oral hygiene) were conducted. The patients were provided with diet care and medication guidance.

The research group adopted comfort nursing based on routine nursing. The specific measures were discussed and formulated by the medical workers of our department based on the inspection during the tonsillectomy and the operation standards [12, 13]. (1) Preoperative care: The children were provided with a warm reception and detailed introduction of the department to increase the familiarity. The children were informed about the disease, surgical operation methods, precautions, and examples of successful cases to establish their confidence about the treatment. The importance of cooperation was informed. For most children, the preoperative care was carried out with sticker rewards, picture guidance, story reading, and animation viewing to help them feel more comfortable about the treatment. For younger children, the key was to improve their sense of security. Pacifiers and vocal toys were used to improve their sense of security and encourage them to cooperate with the treatment. (2) Intraoperative care: The surgical position should be comfortable and operable. To enhance the emotional stability of children, their hands were held lightly to relieve tension and fear, and to avoid stress reactions. For older children, verbal encouragement was provided to make them feel safe. The heart rate and blood pressure of the children were closely observed during the operation. (3) Postopera-

tive care: After the operation, the children were placed in a comfortable, quiet, and clean ward with scientifically adjusted temperature and humidity. If the children were under anesthesia, their families were instructed to turn their head to the side to avoid aspiration. When the children were regaining consciousness and gradually waking up, the bed head was slowly raised from 15° to 30°. Wrapped ice cubes were put at their neck to relieve the pain and speed up the drainage of secretions. The children were asked to not cough hardly or speak loudly. They were closely observed to see if there were bloody secretions from mouth or nose. They were told to drink plenty of water to prevent dry mouth. For children with poor sleep quality, Shenmen and Neiguan acupoints were massaged to improve their sleep. The ward environment was optimized to help their body and mind to be in a calm and free state. Since the surgical wound was in the mouth, the nurses formulated a dietary plan with a professional nutritionist. Eating fruit and drinking juice within the first 12 hours after the operation was not suggested. (4) Discharge guidance: Nurses and the attending doctors customized a discharge rehabilitation exercise plan, such as running and aerobic exercises, to promote the functional recovery. At discharge, a complete follow-up plan was formulated. Regular follow-ups were carried out through telephone or the internet. Relevant scientific care guidance was provided during the follow-up.

Outcome measures

Pain assessment: The visual analogue scale (VAS) was used to evaluate the pain degree of the two groups of children before and after postoperative nursing [14]. The total score of the scale was 10 points, 0 point meant no pain, a score of 1-3 point(s) indicated mild pain, a score of 4 to 6 points indicated moderate pain, and a score of 7 to 10 points indicated severe pain. The lower score represented less pain.

Quality of life: The Generic Quality of Life Inventory-74 (GQOLI-74) was used to evaluate the quality of life of the two groups of children before and 7 days after nursing [15]. GQOLI-74 includes 4 dimensions: social function, physical function, psychological function, and material life status. The scores of the first three dimensions range from 20-100 points. The score of the last dimension ranges 16-80 points. The score of this scale is proportional to the quality of life.

Clinical indicators: Postoperative swallowing recovery time, wake-up time, and hospital stay were analyzed.

Nutrition: Fasting venous blood was collected from the children before the operation and on the 5th day after the operation. The samples were stored for the determination of blood total protein and albumin levels. The reference value of total blood protein is 60-80 g/L, and the reference value of albumin is 40-55 g/L.

Sleep quality: The Pittsburgh Sleep Quality Index (PSQI) was used to evaluate the sleep quality [16]. PSQI has a total score of 21 points, 0-5 points indicate good sleep quality, 6-10 points for not so bad sleep quality, 11-15 points for not so good sleep quality, and 16-21 points for poor sleep quality. The lower the score, the better the sleep quality.

Satisfaction: Satisfaction was evaluated using a self-made percentage scale. The scale includes five parts: service attitude, diet and daily nursing, drug management, complication nursing, and clinical efficacy. The score for each part is 10 points, 30 points, 20 points, 20 points, and 20 points, respectively. The satisfaction rate was calculated by cases of satisfaction (≥85 points) + cases of basic satisfaction (60-85 points)/total number of cases. A score of less than 60 points was regarded as dissatisfaction.

Complications: The cases with postoperative sore throat, bleeding, or infection were counted. Complication incidence = cases with complications/total number of cases * 100%.

The treatment efficacy in the children was followed up for 3 months after the operation.

Statistical analyses

SPSS 20.0 was used for data analyses. Count data were expressed as n (%), and processed by χ^2 test. Measured data were represented by ($\bar{x} \pm sd$), and processed by paired t test and independent t test for intragroup comparisons and intergroup comparisons, respectively. The logistic regression analysis was used to analyze the risk factors for postoperative hemorrhage. Differences were considered statistically significant at $P<0.05$.

Table 1. Comparison of general data between the two groups (n, $\bar{x} \pm sd$)

Index	Research group (n=57)	Control group (n=57)	χ^2/t	P
Sex (n)			0.146	0.702
Male	24	22		
Female	33	35		
Age (years old)	6.2±1.2	5.9±1.5	1.179	0.241
Disease duration (months)	5.15±1.06	5.24±1.03	0.460	0.647
Type of disease (n)			0.751	0.945
Snoring	19	18		
Adenoid hypertrophy	11	13		
Chronic tonsillitis	5	7		
Tonsil hypertrophy	6	5		
Tonsil adenoid hypertrophy	16	14		
Use of dexmedetomidine and ibuprofen (n)			0.146	0.702
Male	24	22		
Female	33	35		

Note: χ^2 is the result from Chi-square test, and t is the results from paired t test.

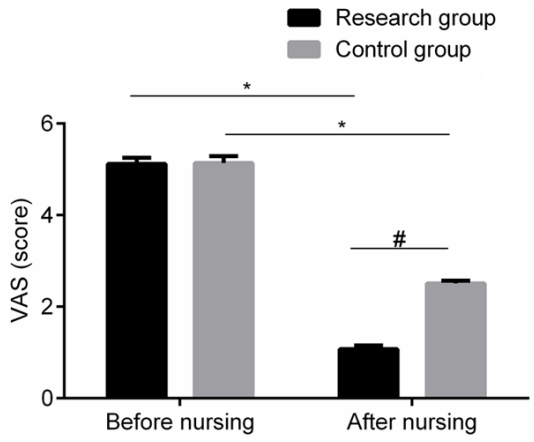

Figure 1. Comparison of pain levels. Compared with before nursing, *P<0.05; compared with the control group, #P<0.05. VAS: Visual Analogue Scale.

Results

Comparison of baseline data

There was no significant difference in general baseline data between the two groups (all P>0.05). The groups were comparable. See **Table 1**.

Comparison of pain levels

Before preoperative nursing, there was no significant difference in VAS scores between the two groups (P>0.05). After nursing, it was found that the VAS scores of the two groups were significantly decreased (both P<0.05), and the score of the research group was significantly lower than that of the control group (P<0.05). See **Figure 1**.

Comparison of quality of life

Before preoperative nursing, there was no significant difference in the GQOLI-74 scores between the two groups (P>0.05). After nursing, the scores of GQOLI-74 in all dimensions were higher than those before nursing in both groups (all P<0.05). The increases in the research group were more obvious (all P<0.05). See **Table 2**.

Comparison of clinical indicators

The postoperative swallowing recovery time, wake-up time, and hospital stay in the research group were significantly shorter than those in the control group (all P<0.05). See **Table 3**.

Comparison of nutritional indicators

Before preoperative nursing, there was no significant difference in blood total protein, and albumin levels between the two groups (both P>0.05). After nursing, the serum levels of total protein and albumin in the research group were significantly higher than those in the control group (both P<0.05). See **Figure 2**.

Comparison of sleep quality

Before preoperative nursing, there was no significant difference in PSQI scores between the two groups (P>0.05). After nursing, the PSQI scores of the two groups were lower than those

Table 2. Comparison of quality of life ($\bar{x}$ ± sd, point)

Group	Time	Social function	Physical function	Mental function	Material life status
Research group (n=57)	Before nursing	72.50±3.98	75.11±5.34	70.16±5.09	67.50±5.18
	After nursing	83.11±5.07#	85.63±6.15#	78.44±5.21#	77.22±3.27#
t		12.428	9.752	8.583	11.980
P		<0.001	<0.001	<0.001	<0.001
Control group (n=57)	Before nursing	72.62±4.01	75.08±5.27	71.05±5.17	68.04±5.05
	After nursing	79.20±6.09	82.10±5.41	75.11±5.95	72.68±3.49
t		6.813	7.063	3.889	5.707
P		<0.001	<0.001	<0.001	<0.001

Note: Compared with the control group, #P<0.05.

Table 3. Comparison of clinical indicators ($\bar{x}$ ± sd)

Group	Postoperative swallowing recovery time (d)	Wake up time (h)	Length of stay (d)
Research group (n=57)	4.7±0.8	3.5±0.8	5.9±0.5
Control group (n=57)	5.9±0.6	4.9±0.4	7.2±0.7
t	9.060	11.818	11.409
P	<0.001	<0.001	<0.001

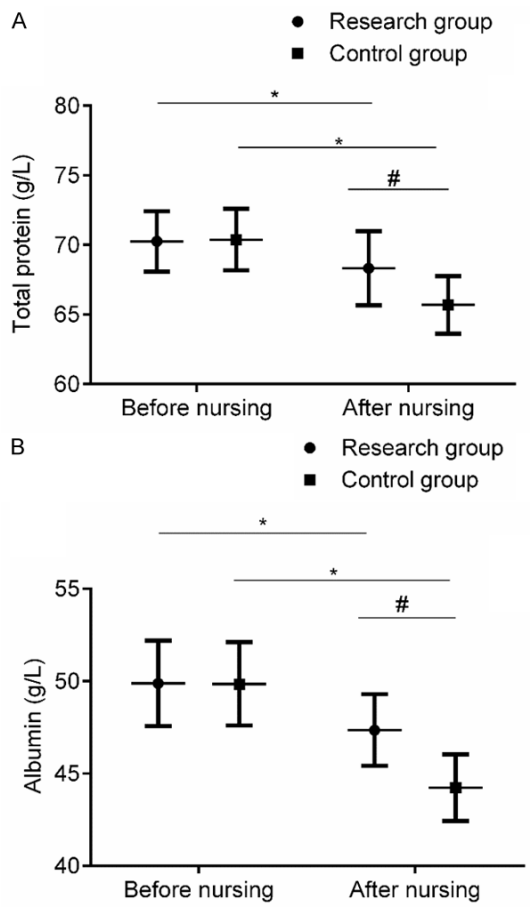

Figure 2. Comparison of nutritional indicators. Compared with before nursing, *P<0.05; compared with the control group, #P<0.05. A: Comparison of blood total protein levels; B: Comparison of albumin levels.

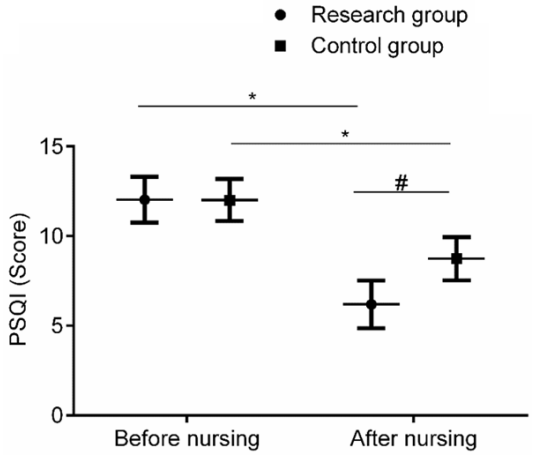

Figure 3. Comparison of sleep quality. Compared with before nursing, *P<0.05; compared with the control group, #P<0.05. PSQI: Pittsburgh Sleep Quality Index.

before nursing. The decrease was more obvious in the research group (all P<0.05). See **Figure 3**.

Comparison of nursing satisfaction

The satisfaction rate of the children in the research group was significantly higher than that of those in the control group (P<0.05). See **Table 4** and **Figure 4**.

Comparison of complications

The overall complication incidence in the research group was significantly lower than

Table 4. Comparison of nursing satisfaction

Group	Satisfaction (n)	Basic satisfaction (n)	Dissatisfaction (n)	Satisfaction rate (n, %)
Research group (n=57)	20	27	10	47 (82.46)
Control group (n=57)	14	22	21	36 (63.16)
χ^2	/	/	/	5.361
P	/	/	/	0.021

Note: χ^2 is the results from Chi-square test.

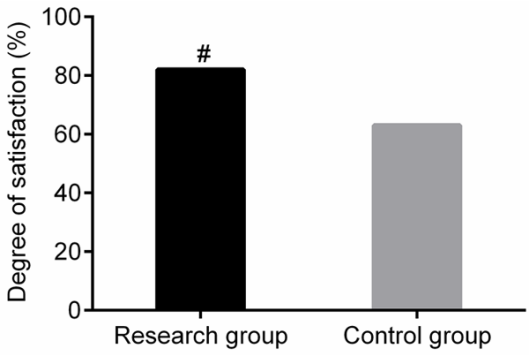

Figure 4. Comparison of nursing satisfaction between the two groups of children. The comparison was conducted using Chi-square test. Compared with the control group, #P<0.05.

that in the control group (P<0.05). See **Table 5**.

Follow-up data

After a 3-month follow-up, the children in both groups were cured without symptoms such as bleeding or respiratory tract infection.

Analysis of risk factors for postoperative hemorrhage

In the 114 children who underwent tonsillectomy, there were 4 cases (2.78%) of postoperative bleeding. There was no significant difference in terms of sex, intraoperative pain, and family history of snoring between the two groups (all P>0.05). There were significant differences in terms of the proficiency of surgeon, postoperative upper respiratory infection, and degree of tonsillar embedment (all P<0.05). See **Table 6**.

The logistic regression analysis of the above factors with statistical differences showed that postoperative upper respiratory infection and the degree of tonsillar embedment were independent risk factors for post-tonsillectomy hemorrhage (both P<0.05).

Discussion

The therapeutic efficacy of tonsillectomy is positive. The postoperative pain has a great impact on patients, especially in children, who have a lower pain tolerance than that of adults, and are more fear of surgery. This is not conducive to the postoperative recovery and can affect the treatment efficacy [17]. Scholars have found that providing comfort nursing to children undergoing tonsillectomy can relieve their anxiety and tension, improve compliance, and promote the recovery of body functions [18].

The concept of comfort nursing is advanced, scientific, and targeted. It is a patient-orientated nursing mode conducted from multiple aspects to help the children to have positive psychological state and physical conditions. This plays an important role in reducing the incidence of postoperative complications [19]. The tonsils are located in the throat, where peripheral nerves and blood vessels are abundant. Postoperative pain is the main problem for children undergoing tonsillectomy. This study implemented different nursing measures. We found significantly reduced VAS scores and increased GQOLI-74 scores in all dimensions in both groups. The improvements were more significant in the research group than those in the control group. The swallow recovery time, wake-up time, and hospital stay were significantly shorter, the complication rate was significantly lower, and the satisfaction rate was significantly higher in the research group than those in the control group. These results indicated that providing comfort nursing to children undergoing tonsillectomy can help reduce pain, and improve clinical efficacy and quality of life. We adopted placing a cooling bag on their neck. The low temperature stimulated vasoconstriction, reducing local blood flow, improving vascular permeability, inhibiting blood oozing, and playing an analgesic role. Comfort nursing program belongs to targeted nursing. The low pain

Table 5. Comparison of complications

Group	Sore throat (n)	Bleeding (n)	Infection (n)	Incidence of complication (n, %)
Research group (n=57)	1	1	1	3 (5.26)
Control group (n=57)	3	3	5	11 (19.30)
χ^2	/	/	/	5.211
P	/	/	/	0.022

Note: χ^2 is the results from Chi-square test.

Table 6. Risk factors of postoperative hemorrhage

Item	Hemorrhage (n=4)	No hemorrhage (n=110)	P
Sex			0.689
Male	2	44	
Female	2	66	
Proficiency of surgeon			0.007
≥6 year-experience	1	89	
≤5 year-experience	3	21	
Postoperative upper respiratory infection			0.001
Yes	3	3	
No	1	107	
Intraoperative pain			0.781
Mild	3	68	
Medium	1	32	
Severe	0	10	
Degree of tonsillar embedment			0.031
Mild	1	65	
Medium	0	23	
Severe	3	22	
Family history of snoring	2	87	0.167

threshold and limited activities during hospitalization helped the children who received care measures such as sticker rewards, picture guidance, story reading, and animation viewing to feel more encouraged and more secure. This was beneficial to the outcome and quality of life. Our results were consistent with those of a related study [20]. Another study showed that after the excision of tonsil with different degree of embedment, the exposed trauma area in the oropharynx was positively associated with the postoperative hemorrhage in children [21]. For tonsil with non-deep embedment, the surgery would leave a shallow tonsillar fossa and a relatively small trauma. For tonsil embedded deeply, there would be a deeper tonsillar fossa and a larger trauma area. In this study, the results of the logistic regression analysis showed that the postoperative upper respiratory infection and the degree of tonsil embedment were independent risk factors for post-tonsillectomy bleeding. This was consistent with the results of related study [21].

After tonsillectomy, the pain and bleeding prevented children from eating. The early postoperative nutritional intake cannot be supplied, affecting the recovery of body function [22]. In this study, it was found that the levels of total blood protein and albumin in the research group (comfort nursing) were higher than those in the control group. This suggested that comfort nursing can significantly improve the postoperative nutritional status and improve the prognosis in children undergoing tonsillectomy. This is because during comfort nursing, a targeted diet plan was formulated by a nutritionist according to the postoperative situation of each child. This was more conducive to the nutritional supplement [23]. During hospitalization, most children have varying degrees of sleep disturbances. This resulted from the nerve-stimulating effects of some drugs. Preoperative preparation requires long-term infusion, which could lead to nervousness. Another major reason was that the children were in an unfamiliar environment, the hospital, which was not conducive to the sleep quality. The quality of sleep was one of the important factors affecting the recovery and mental health of the children [24, 25]. Results of this study showed that after postoperative nursing, the PSQI scores of the two groups were significantly lower than those before preoperative nursing. The decrease in the research group (comfort nursing) was more obvious than that in the control group. This was because during comfort nursing, the sleeping

environment was optimized, and the relevant acupoints were massaged. We believe that the child-orientated nursing measures formulated after a comprehensive assessment of the postoperative physical and mental state were conductive to improving the child's sleep quality.

The limitations of this study included a small sample size, limited evaluation indicators, and single-center enrollment. It is necessary to carry out a larger sample and multi-center study on comfort nursing in further studies, especially to evaluate the rehabilitation after surgery.

In conclusion, comfort nursing for children undergoing tonsillectomy can significantly reduce the pain, shorten the hospital stay, improve nutritional status, facilitate postoperative recovery, and improve the quality of life. It is worthy of clinical application.

Disclosure of conflict of interest

None.

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