



Perioperative Effect of Nursing Model Based on Nursing Quality Evaluation System in Otorhinolaryngology Patients

Yingli Li¹, Qian Yang¹, Xin Wang¹, Lin Liu¹, Yang Li¹, Ying Zhang¹, *Bo Wang²

1. Department of Otolaryngology, the Third Affiliated Hospital of Qiqihar Medical College, Qiqihar City, Heilongjiang Province, 161000, China
2. Department of Neurology, the Third Affiliated Hospital of Qiqihar Medical College, Qiqihar City, Heilongjiang Province, 161000, China

*Corresponding Author: Email: Wangbo6960@qmu.edu.cn

(Received 18 Jan 2023; accepted 27 Jul 2023)

Abstract

Background: To explore the perioperative effect of the evaluation system of nursing quality in otorhinolaryngology patients.

Methods: A total of 100 patients hospitalized in the Department of Otorhinolaryngology of the Third Affiliated Hospital of Qiqihar Medical College, Qiqihar City, China in 2019 were selected as the control group, and routine nursing mode was adopted. The control group was data before the implementation of this study. A total of 100 patients (experimental group) hospitalized in the Department of Otolaryngology in 2020 were selected to adopt the nursing model constructed by nursing quality evaluation system. The adverse mood of patients in the two groups were evaluated at admission and discharge, and postoperative pain and satisfaction were compared between the two groups.

Results: Anxiety, depression and quality of life scores were improved in both groups, but the degree of improvement in experimental group was significantly higher than that in control group ($t=481.759, 353.502, P<0.05$), and the postoperative pain score in experimental group was lower than that in control group ($t=54.086, P<0.05$). The satisfaction of experimental group was better than that of control group ($\chi^2=30.327, P<0.05$).

Conclusion: The nursing model based on the evaluation system of the nursing quality of otorhinolaryngology can relieve patients' adverse emotions, relieve postoperative pain of otorhinolaryngology patients, and improve patient satisfaction. Therefore, it is worth popularizing and applying in the future.

Keywords: Ear, Nose and throat diseases; Perioperative; Nursing quality evaluation system; Nursing

Introduction

China has a large number of ear, nose and throat (ENT) diseases patients, accounting for 80% of the total number of patients worldwide (1). ENT

diseases have a long course and are mostly combined with auditory, olfactory and acoustic disorders. Patients are often accompanied by different



degrees of psychological disorders, such as anxiety, depression, mania, etc. (2). Approximately half of patients with ENT disease need surgery. However, ENT surgery sites are mostly located in the nasal cavity, ear canal or respiratory tract where nerves and blood vessels are densely distributed, so the postoperative pain is more intense and lasts longer than other surgical procedures. What's more, the bad mood of postoperative patients is more obvious, which affects the prognosis and recovery (3).

Therefore, it is crucial to find out how to effectively relieve postoperative patient pain and reduce the degree of perioperative dysphoria.

Clinical care is an important part of daily treatment, and the role of different care models in the occurrence of perioperative dysphoria also varies. At present, the studies on nursing models that effectively alleviate postoperative dysphoria in ENT patients are relatively rare. Most of the reported effective nursing models focus on patient psychological counseling and emphasize humanistic care, they are less holistic and specific, and lack quality standards for guiding and judgment (4). Nursing quality evaluation system or can make up for the above deficiencies. Previous study revealed that the nursing quality evaluation system is an effective tool, which can assess nursing quality and guide nursing work, with evaluation indicators as the basic elements (5). Specialized nursing evaluation indicators with high specificity according to the characteristics and problems of nursing in different disciplines was developed by the nursing quality evaluation system. Postpartum depression as an evaluation index was included in the obstetric specialty care quality evaluation system, which significantly reduced the incidence of adverse emotions such as postpartum depression (6).

However, there is no specialist nursing evaluation system for postoperative ENT patients. Therefore, we aimed to explore the perioperative effect of the evaluation system of nursing quality in otorhinolaryngology patients.

Materials and Methods

General data

The sample size calculation (7) between 2 groups was $N = (U_{\alpha} + U_{\beta})^2 2P(1-P) / (P1 - P2)^2$, U_{α} is the test level, and U_{β} is the value corresponding to the probability of type II error ($U_{\alpha}=1.64$, $U_{\beta}=1.28$). P1 and P2 are estimates of the prevalence of anxiety and depression in ENT patients with preoperative and postoperative, respectively, and P is the cumulative rate. The prevalence of anxiety and depression in ENT patients is about 20%. We aimed to improve the patients' adverse mood to reduce it to 5% through a trial, therefore, the sample size was calculated to be 100 according to formula.

A total of 100 patients hospitalized in the Department of Otorhinolaryngology of the Third Affiliated Hospital of Qiqihar Medical College, Qiqihar City, China in 2019 were selected as the control group, and routine nursing mode was adopted. The control group was data before the implementation of this study. A total of 100 patients (experimental group) hospitalized in the Department of Otolaryngology of our hospital from January 2020 to December 2020 were selected to adopt the nursing model constructed by nursing quality evaluation system.

Patient inclusion Criteria were: 1. ENT patients requiring surgical treatment. 2. Patients with no previous mental illness who can cooperate with the experimental study. 3. Voluntary participation and signed informed consent form.

Exclusion criteria were: 1. Those who perform surgical procedures other than ENT surgery. 2. Pre-existing serious underlying medical conditions, or inability to participate in the entire study. There was no significant difference in general data between the two groups.

Nursing method in the control group

Patients in the control group were treated with the usual perioperative care methods. The nursing contents includes: admission safety preaching, preoperative water fasting notification, postoper-

ative implementation of medical advice, regular observation of patients' vital signs and wound bleeding and drainage, etc.

The evaluation criteria of nursing quality, such as execution rate of medical orders, incidence of adverse events, qualified rate of ward management, qualified rate of technical operation, patient complaint rate, etc. are evaluated by nursing department (once every 6 months), department (once a quarter) and head nurse (once a month).

Construction of nursing quality evaluation system

First of all, we set up a nursing evaluation system group. A total of 15 nurses were selected to set up a nursing management evaluation team. There was 1 chief superintendent nurse, 2 co-chief superintendent nurses, 5 nurses-in-charge and 7 nurses in this team, which head-nurse was the

leader. All team members were required to have a bachelor degree or higher and at least 5 years of first-line clinical nursing experience. Participants were required to pass a psychological intervention course instructed by a professional psychological rehabilitation practitioner before they were allowed to participate in the experiment. There were 3 data collectors and statisticians in the team, and the experimental data were collected and kept by these 3 members. What's more, we constructed an evaluation system. By reviewing the previous research and related books (8), initial evaluation metrics were established, and then screened according to the statistics method. After that, we interviewed ENT specialists to supplement the evaluation metrics within the evaluation system. At last, ENT nursing quality evaluation system was established based on the Delphi method (Table 1).

Table 1: ENT nursing quality evaluation system

<i>Level 1 Indicators</i>	<i>Level 2 Indicators</i>	<i>Level 3 Indicators</i>
Elements Index	Personnel allocation	Bed-nurse ratio Nurse-patient ratio
	Nurse competence	Training hours for nurses' knowledge related to otorhinolaryngology and psychotherapy Passing rate of professional knowledge assessment for nurses in otorhinolaryngology
Procedure Index	Disease observation	Accuracy of mental health assessment Accuracy of the pain assessment Accuracy of the sleep quality assessment Length of psychological counseling
		Accuracy rate of vital signs detection Timely rate of respiratory function detection Timeliness of neurological function testing
	Complication intervention Nursing Records	Timeliness of pain interventions Accuracy of determining complications of ENT surgery Nursing Record Writing Accuracy of nursing records Timeliness of medical advice execution
		System implementation rate of responsible nurses
Final Index	Patient	Satisfaction with patients Nursing complaint rate
	Nurse	Tube blockage rate in intubated patients Satisfaction with nursing care Incidence of accidental injury among nurses

Implementation of ENT nursing quality evaluation system

The evaluation indexes included in the ENT nursing quality evaluation system are used as evaluation contents. The bed-nurse ratio, nurse-

patient ratio and training hours of ENT-related knowledge are evaluated according to the indexes in the system. and the problems found are rectified according to the quality control results (Table 2).

Table 2: Content of ENT nursing quality evaluation system

<i>Subject</i>		<i>Content</i>
Evaluation time		At the time of patient admission
Evaluation frequency		Elements Index: once a week, Procedure Index: once a week, Final Index: once a month
Valuator		Head-nurse
Evaluation content	Elements index evaluation	Bed-nurse ratio and nurse-patient ratio were evaluated once a week to ensure that the bed-nurse ratio $\geq 1:0.4$ and the nurse-patient ratio $\leq 1:8$. The professional knowledge assessment pass rate should be required to reach 100%. The bedside nurse should assess the psychological health, pain, and sleep of the three sampled patients with 90% accuracy. The total duration of psychological counseling for the five sampled patients should be at least 14 hours.
	Procedure Index evaluation	Every Sunday, the head-nurse will evaluated in the ward. The evaluation of the included indexes should be no less than five times, and no less than six patients per day, then the accuracy rate should be calculated.
	Final index evaluation	The nursing department counted the number of patient complaints in that month. Monthly satisfaction of discharged patients was collected by questionnaire. According to the questionnaire, the head nurse counted the nursing satisfaction rate of nursing team members and the pipe blockage of intubated patients.

Quality Assurance

1) Personnel allocation. For those whose nurse-patient ratio and bed-nurse ratio do not meet the standard, on the one hand, increase the number of nursing staff while optimizing the scheduling system, and on the other hand, pay attention to the hierarchical allocation of nursing teams. 2) In order to ensure the homogeneity of the evaluation, before the implementation of the evaluation system, the nursing staff of the department was uniformly trained and the three-level ward rounds system was implemented. The head nurse paid attention to the bedside nurses' assessment methods, ability and accuracy of patients' conditions, sleep, complications, respiratory function and neurological function during the daily ward rounds. 3) Focus on the failing indexes after evaluation, strengthen the training work of nurses, especially for patients with nasolaryngology

surgery, and have senior nurses take over after surgery, and establish a database of evaluation and correction contents. 4) The whole experiment was executed under the supervision of the head-nurse, the collected data was kept by the group, data entry and statistical analysis was performed by 3 members, 1 entry clerk, 1 statistician and 1 verifier. If the verifier found data discrepancies, timely corrections were made.

Evaluating indexes

Symptom Checklist 90 (SCL-90), Self-Rating Anxiety Scale (SAS), Self-rating depression scale (SDS), and Visual Analogue Scale(VAS) were used to assess the psychological health and pain levels in the two groups of patients at admission and discharge. SCL-90 was proposed to assess psychological health in 1975 (4). There are 90 entries and 9 dimensions, namely somatization,

obsessive-compulsive symptoms, interpersonal sensitivity, depression, anxiety, hostility, terror, paranoia, and psychoticism in SCL-90. It used a Likert 5-point scale with a total score of 90 to 450, with higher scores indicating progressively worse symptoms, Cronbach's $\alpha = 0.984$. SAS was proposed to assess the patient's subjective feelings of anxiety and its change during treatment in 1971 by W.K.Zung (9). SAS consists of 20 items and uses the Likert 4-point scale to assess the frequency of symptoms, Cronbach's $\alpha = 0.80$ (10). SDS was proposed to assess the patient depression levels in 1965 by W.K.Zung (11). Depression index less than 0.50 is no depression, 0.50 to 0.59 is mild depression, 0.60 to 0.69 is moderate to severe depression, and 0.70 or more is severe depression. Cronbach's $\alpha = 0.80$. VAS was proposed to assess the pain in clinical in 1975 by Ohnhaus (12). A score of 0 indicates no pain and a score of 10 represents the most intense pain that is unbearable. The patient satisfaction rating questionnaire was self-designed with reference to previous study (13), with a score of 100, and

three evaluation criteria were set: particularly satisfied is more than 90, generally satisfied is more than 50 and less than 89, and unsatisfied is less than 50. Total satisfaction (%) = particularly satisfied + generally satisfied/total number.

Statistical analysis

The data of this study were analyzed by SPSS 22.0 statistical software (IBM Corp., Armonk, NY, USA). The measurement data were expressed by $\chi^2 \pm S$, independent samples t-test was used for comparison between groups. The statistical data were expressed as percentages, and the rank sum test was used for comparison between groups. The differences were statistically significant, $P < 0.05$.

Results

Comparison of Patient General Data

The general data were comparable between the two groups with no significant difference ($P < 0.05$) (Table 3).

Table 3: Comparison of Patient General Data

<i>Character</i>		<i>Control group</i>	<i>Experimental group</i>	χ^2/t	<i>P</i>
Gender	Male	65	63	0.086	0.768
	Female	35	37		
Age (years)		33.17 \pm 2.23	33.67 \pm 2.34	1.546	0.123
Education	Primary school	22	20	0.277	0.870
	Junior school	27	24		
	Senior school	31	33		
	College degree or above	20	23		
Occupation	Manual workers	59	56	0.184	0.667
	Nonmanual workers	41	44		
Underlying disease	Diabetes	29	30	0.016	0.991
	Hypertension	33	35		
	Coronary disease	37	40		
Disease site	Aural region	32	30	0.213	0.898
	Epipharynx	61	64		
	Laryngeal part of pharynx	7	6		
Nature of disease	Optimum	97	95	0.130	0.718
	Malignant	3	5		

Table 3: Continued...

Surgical category	Correction of deviated septum	25	27	0.638	0.887
	Nasal polypectomy	21	23		
	Otitis media surgery	22	18		
	Vocal Cord Polyps Removal	7	6		
	mastoidotympanectomy	10	12		
Day of hospitalization (days)	Nasal trauma surgery	15	14	17.120	0.000
Fee type	City Health Insurance	8.77±1.12	6.57±0.63	0.381	0.827
	Rural cooperative health insurance	37	35		
	Self-financed	28	32		
Hospitalization cost (ten thousand yuan)		3.61±0.81	2.41±0.62	11.764	0.000
Surgical approaches	Lumpectomy	46	45	0.020	0.887
	Open surgery	54	55		
Mean duration of surgery	Ear	121.47±3.31	121.75±4.65	0.490	0.624
	Nose	105.66±3.08	106.01±2.97		
	Laryngeal part of pharynx	143.84±2.64	143.96±2.43		

Comparison of pain and negative emotions in the two groups

The differences in pain and negative emotions between the two groups were not statistically significant at admission ($P > 0.05$), but the differences were statistically significant at discharge compared to admission in both groups ($P < 0.05$). Experimental group scores were significantly lower at discharge than at admission, and the difference was statistically significant ($P < 0.05$).

The scores on the symptom self-rating scale at admission were comparable between the two groups, and the differences were not statistically significant ($P > 0.05$). At discharge, all the scores of each dimension were lower than those at admission, but the degree of reduction in the experimental group was significantly greater than that in the control group, and the difference was statistically significant ($P < 0.05$) (Table 4, 5).

Table 4: Comparison of the patient's pain and negative emotions

Score		Experimental group	Control group	t	P
Pain score	At admission	3.28±0.22	3.31±0.31	0.789	0.430
	At discharge	1.15±0.18*	4.28±0.55	54.086	0.000
Self-rating anxiety scale	At admission	67.38±0.55	67.65±1.39	1.806	0.072
	At discharge	18.44±0.57*	54.34±0.48	481.759	0.000
Self-rating depressive scale	At admission	71.82±0.65	71.71±0.29	1.546	0.124
	At discharge	33.04±0.19*	69.37±1.01	353.502	0.000

Note: * means $P < 0.05$ compared with hospital admission.

Table 5: Comparison of the patient symptom self-rating scale scores

<i>Dimension</i>	<i>Control group</i>		<i>Experimental group</i>	
	At admission	At discharge	At admission	At discharge
Somatization	26.18±1.35	10.12±1.18*	27.03±1.22	20.16±1.47*#
Forced symptoms	28.15±1.09	10.25±1.43*	28.23±1.10	19.57±1.62*#
Sensitive to interpersonal relationship	27.06±1.47	9.15±1.26*	26.15±1.06	20.11±1.21*#
Depressed	25.13±1.66	8.51±0.79*	24.97±1.13	19.11±1.64*#
Anxiety	23.34±0.98	9.11±1.67*	23.15±0.84	18.38±0.81*#
Hostility	18.17±1.15	8.79±1.05*	17.68±1.03	14.43±0.93*#
Phobias	18.96±0.77	9.37±1.68*	18.13±0.65	14.48±0.62*#
Paranoia	19.17±0.39	8.95±0.28*	18.91±0.26	16.16±0.17*#
Psychiatric tendency	16.22±0.68	9.13±0.92*	15.93±0.55	11.31±0.57*#

Note: * means $P < 0.05$ compared to admission; # means $P < 0.05$ compared to the control group

Comparison of patient satisfaction after intervention

The satisfaction of patients in the two groups was comparable, and the experimental group was bet-

ter than the control group, with statistically significant differences ($P < 0.05$) (Table 6).

Table 6: Comparison of patient satisfaction

<i>Group</i>	<i>Very satisfied</i>	<i>Satisfied</i>	<i>Unsatisfied</i>	<i>degree of satisfaction (%)</i>
Control group	53	35	2	98
Experimental group	23	59	18	82
χ^2				30.327
P				0.000

Discussion

The nursing model based on the ENT quality evaluation system can reduce patient dysphoria

Reviewing the previous research, studies on the construction of a quality evaluation system for ENT are rare, and there is a lack of research reports on the effects of its clinical application, especially on patients' adverse emotions (14,15). This study compared the self-rating scores and anxiety and depression scores between the two groups. The results showed that the postoperative scores of both groups were lower than the preoperative scores. The reduction in scores in the experimental group was significantly greater than that in the control group, which proved that

the ENT nursing quality evaluation system could better improve the mental health of patients and alleviate the adverse emotions.

There are some advantages of ENT nursing quality evaluation system. First of all, it has more specific quantitative evaluation criteria, detailed requirements for nurses to judge the accuracy of adverse emotions and pain, and good prediction power for the psychological condition and pain level of patients, which helps to provide targeted treatment for patients. What's more, traditional nursing evaluation system is mostly empirical summaries with a low level of evidence and lack of evidence-based support, and the indicators included are mostly end-of-life indicators while ignoring element and link indicators. In addition,

ENT nursing quality evaluation system emphasizes the regular training and appraisal of bedside nurses in the areas of otolaryngology and psychological counseling to make nurses more specialized in daily psychological interventions. It also sets requirements for the length of psychological interventions for patients to ensure that patients can receive psychological interventions on a sustainable basis.

The nursing model based on the ENT quality evaluation system can relieve postoperative pain and increase satisfaction

Pain, a common post-surgical complication, is an important factor affecting the patient's postoperative recovery (16). The reduction of postoperative pain can significantly shorten the postoperative rehabilitation time, increase the degree of patient compliance, and is conducive to their functional recovery (17). In this investigation, patients in the experimental group had significantly reduced postoperative pain. Analysis of the reasons for this may be related to the fact that the nursing model adopted by the experimental group can detect the patient's pain more early, and report to the bedside physician for pain and symptomatic management in a more timely manner. Besides, the postoperative pain of patients is partly caused by psychology, and the nursing model adopted by the experimental group is more systematic and organized than the traditional model, so that the problems in nursing work can be solved in time and avoid unnecessary conflicts with patients. Patients are mentally sensitive and easy to depression, increasing the inpatient comfort of patients can also reduce the degree of depression and anxiety of patients. However, if the nursing staff do not detect psychological abnormalities and use the traditional nursing models, inadequate communication will lead to nurse-patient disputes. It also makes nursing staff doubtful and tired of their profession. The nursing model adopted in this study can improve the working ability of nursing staff, deepen their understanding of otorhinolaryngology, resulting in a greater focus on daily communication with patients.

Conclusion

The nursing model guided by the ENT quality evaluation system can alleviate patients' adverse emotions, reduce postoperative pain in ENT patients, and improve patient satisfaction. Therefore, it is worth promoting its application in the future.

Journalism Ethics considerations

Ethical issues (Including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, redundancy, etc.) have been completely observed by the authors.

Acknowledgements

This work was supported by Science and Technology Plan Joint Guidance Project of Qiqihar City (LSFGG-2023020).

Conflict of Interest

The authors declare that there is no conflict of interest.

References

1. Stuck BA, Dreher A, Heiser C, et al (2015). Diagnosis and treatment of snoring in adults-S2k Guideline of the German Society of Otorhinolaryngology, Head and Neck Surgery. *Sleep Breath*, 19(1):135-48.
2. Zhang X (2014). Depression of testes-specific protease 50 (TSP50) inhibits cell proliferation and induces apoptosis in laryngocarcinoma. *Tumour Biol*, 35(11):10781-8.
3. Huang Y, Chen H (2021). High-Quality Nursing Care for the Elderly in the Department of Otolaryngology. *J Healthc Eng*, 2021:5542562.
4. Carrozzino D, Siri C, Bech P (2019). The prevalence of psychological distress in Parkinson's disease patients: The brief symptom inventory (BSI-18) versus the Hopkins symptom checklist (SCL-90-R). *Prog Neuropsychopharmacol Biol*

- Psychiatry*, 88:96-101.
5. Griffiths P (1995). Progress in measuring nursing outcomes. *J Adv Nurs*, 21(6):1092-100.
 6. Murthy L, Shepperd S, Clarke MJ, et al (2012). Interventions to improve the use of systematic reviews in decision-making by health system managers, policy makers and clinicians. *Cochrane Database Syst Rev*, (9):CD009401.
 7. Curtin RB, Sitter DC, Schatell D, Chewning BA (2004). Self-management, knowledge, and functioning and well-being of patients on hemodialysis. *Nephrol Nurs J*, 31(4):378-86, 396;
 8. Burston S, Chaboyer W, Gillespie B (2014). Nurse-sensitive indicators suitable to reflect nursing care quality: a review and discussion of issues. *J Clin Nurs*, 23(13-14):1785-95.
 9. Lee SS, Allen J, Black DW, Zanarini MC, Schulz SC (2016). Quetiapine's effect on the SCL-90-R domains in patients with borderline personality disorder. *Ann Clin Psychiatry*, 28(1):4-10.
 10. Matusiak-Wieczorek E, Dzionkowska-Zaborszczyk E, Synder M, Borowski A (2020). The Influence of Hippotherapy on the Body Posture in a Sitting Position among Children with Cerebral Palsy. *Int J Environ Res Public Health*, 17(18):6846.
 11. Hidese S, Ogawa S, Ota M, Ishida I, Yasukawa Z, Ozeki M, Kunugi H (2019). Effects of L-Theanine Administration on Stress-Related Symptoms and Cognitive Functions in Healthy Adults: A Randomized Controlled Trial. *Nutrients*, 11(10):2362.
 12. Reyhan AC, Sindel D, Dereli EE (2020). The effects of Mulligan's mobilization with movement technique in patients with lateral epicondylitis. *J Back Musculoskelet Rehabil*, 33(1):99-107.
 13. Yang X, Li L, Liu Y, et al (2021). Establishing quality evaluation system of nursing management in fever clinics: A Delphi method. *J Nurs Manag*, 29(8):2542-2556.
 14. Oliveira NB, Peres HHC (2021). Quality of the documentation of the Nursing process in clinical decision support systems. *Rev Lat Am Enfermagem*, 29:e3426.
 15. Xiaoli S, Weiyan H, Li D (2022). Construction of Neonatal PICC Nursing Quality Evaluation System. *Appl Bionics Biomech*, 2022:8290526.
 16. Codonhato R, Rubio V, Oliveira PMP, et al (2018). Resilience, stress and injuries in the context of the Brazilian elite rhythmic gymnastics. *PLoS One*, 13(12):e0210174.
 17. Cruz-Díaz D, Romeu M, Velasco-González C, Martínez-Amat A, Hita-Contreras F (2018). The effectiveness of 12 weeks of Pilates intervention on disability, pain and kinesiophobia in patients with chronic low back pain: a randomized controlled trial. *Clin Rehabil*, 32(9):1249-1257.