Effect of Continuous Nursing Care on Self-Care Ability, Quality of Life, And Nursing Compliance of Elderly Patients with Laryngeal Cancer Undergoing Laryngectomy

Yuanyuan Yang, Peiju Zhou, Minjing Gu[*]

Abstract

Aim: This study aims to explore the application of continuous nursing care in elderly patients with laryngeal cancer (LC) undergoing surgery.

Methods: We randomly assigned 101 LC patients undergoing laryngectomy in our hospital from May 2014 to December 2019 to receive conventional nursing care (the regular group, n=49) or continuous nursing care (the research group, n=52). The outcomes of care interventions in the two groups were recorded.

Results: The rate of good nutrition was higher in the research group than in the regular group (P < 0.05). After care, the sleep quality and psychological resilience of patients markedly improved in both groups. Compared to the regular group, the research group had lower scores of the Pittsburgh Sleep Quality Index (PSQI), higher scores of the Conner-Davidson Resilience Scale (CD-RISC), lower scores of negative emotions, higher scores of self-care ability, higher scores of the Quality of Life Questionnaire-Core 30 (QLQ-C30), a higher nursing compliance rate, and a higher satisfaction rate (all P < 0.05).

Conclusion: Continuous nursing care can markedly enhance the self-care ability, nursing compliance, and postoperative quality of life of elderly LC patients undergoing laryngectomy.

Keywords: Continuing nursing care, laryngectomy for laryngeal cancer, self-care ability, quality of life

INTRODUCTION

Laryngeal cancer (LC) is the second most common cancer occurring in head and neck, with increasingly high incidence in recent years(Ahn et al.,2017). The incidence of LC also increases with age, frequent in elderly patients, more common in males than in females(Kishimoto et al.,2019;Wei et al.,2018). With the continuous development of society, causes of LC become complicated, including noise pollution, bad living habits, excessive use of voice, accelerated life rhythm, and various precancerous lesions(Zuo et al.,2017;Shivappa et al.,2016). Currently LC is mainly treated with resection in the head and neck, which may induce pronunciation difficulty, impaired respiratory function, choking during meals etc., damaging the patient's quality of life(Silveira et al.,2018;Anschuetz et al., 2019). Basic diseases in the elderly patients and negative emotions including even depression in severe cases greatly prolong the recovery time of patients and impair their social interactions, which brings great challenges for the nursing care(Zhang et al.,2017). Therefore, a nursing care that can strengthen the clinical nursing for elderly LC patients after surgery is of great significant for the nursing quality and recovery of patients.

Currently, conventional nursing care is helpful but cannot satisfy the needs of most patients for the nursing care(Xu et al.,2019). Continual nursing care is dynamic, consistent, and coordinated, which engages families and communities in the nursing services and continuously follows up patients to improve disease management(McCollister et al.,2016). Besides, continuous nursing care is adaptive and long-lasting to motivate the positivity

Department of Otorhinolaryngology and Stomatology, The First Affiliated Hospital of Soochow University, Suzhou, Jiangsu Province, China.
Correspondending Author:Minjing Gu
Email: gmj0716tg@163.com

of patients to participate in the treatment(Jenkinson and Howard ,2016;Bergman et al.,2015). So the continuous nursing care has facilitated social progression(Tworek et al.,2019). Here we performed different nursing modes in elderly LC patients undergoing surgery to analyze the application of continuous nursing care.

1. METHODS

1.1 Basic information

We randomly assigned 101 LC patients undergoing laryngectomy in our hospital from May 2014 to December 2019 to receive conventional nursing care (the regular group, n=49) or continuous nursing care (the research group, n=52). The two groups were comparable as they were not notably different in basic clinical data. More details are shown in Table 1. In no violation of ethics, this study was approved by the ethics committee of our hospital. All patients and their families signed the written informed consent.

Inclusion and exclusion criteria

Inclusion criteria: Patients diagnosed with LC; patients with complete clinical data; patients with normal consciousness; patients with no history of mental illness; patients accompanied by family members upon admission; patients with stable vital signs; patients with no contraindications to surgery.

Exclusion criteria: Patients who withdrew from the study halfway; patients with recurrent or metastatic LC; patients previously treated with radiotherapy or chemotherapy; patients with other malignant tumors; patients with severe liver and kidney dysfunction; patients with blood and immune system diseases.

Table 1. **Basic clinical data of patients in the two groups ($\bar{x}$±sd), [n (%)]**

	Research group (n = 52)	Regular group (n = 49)	X^2/t	P
Sex			0.285	0.593
Male	50(96.15)	48 (97.96)		
Female	2 (3.85)	1 (2.04)		
Average age (year)	60.98 ± 6.71	60.14 ± 6.34	0.646	0.520
Educational level			0.081	0.776
Below high school	28 (53.85)	25 (51.02)		
High school or above	24 (46.15)	24 (48.98)		
Place of residence			0.188	0.665
Urban area	34 (65.38)	30 (61.22)		
Rural area	18 (34.62)	19 (38.78)		
Cancer type			0.581	0.901
Supraglottic laryngocarcinoma	15 (28.85)	13 (26.53)		
Glottic carcinoma	19 (36.54)	18 (36.73)		
Infraglottic laryngocarcinoma	13 (25.00)	11 (22.45)		
Transglottic carcinoma	5 (9.61)	7 (14.29)		

1.2 Nursing methods

Regular group: Patients in the regular group received conventional nursing care. We established personal files for patients and introduced disease-related knowledge and precautions to patients regularly. Before surgery, we recorded the allergy history of patients and informed them of preoperative precautions. After surgery, we guided their medication, diet arrangement, and daily schedules. During the hospitalization, the vital signs of patients were closely monitored. We disinfected the ward regularly and made it comfortable.

Research group: Patients from the research group received continuous nursing care based on conventional nursing. According to the patient's case history, personality characteristics, surgical tolerance, etc., we introduced disease-related knowledge to patients, guided the daily schedule and diet arrangement, and detailed the purpose, methods, and complications that may occur during and after surgery in a customized way. Any questions raised by patients were patiently answered to eliminate their fear, obtain their trust, and enhance their care compliance. After surgery, we regularly checked the patient's respiratory tract to ensure the smoothness of the airway. If the patient's physical condition allowed, we instructed patients to exercise moderately to prevent complications. To distract the patient's attention on the postoperative pain, we exposed patients to soft

music and massaged their muscles. We assessed the psychological state of patients and shared successful cases to relieve their negative emotions and turned to psychologist if necessary. Families were kept informed of the recovery of patients so that they could give care and support to encourage patients to actively cooperate with the postoperative recovery treatment. We gave the relevant discharge guidance 1 day before patients were discharged from the hospital and explained the health knowledge again. Each patient left the hospital with a card recording the contract of the responsible physician and nurse to facilitate patients to go back to the hospital for treatment as soon as possible in cases of abnormal conditions. All patients received one-to-one continuous nursing care every week and their recovery details were recorded for later reference. At each visit, we instructed patients in the respiratory care, diet arrangement, fistula care, and language training, answered in detail questions raised by the patients, and detailed the disease progression and common sense of nursing to help patients foster a positive and correct attitude at the disease and recovery.

1.3 Outcome measures

1. The Subjective Global Assessment (SGA) (Hipskind et al., 2019) was used to determine the patient's nutritional status, varying from good nutrition, mild and moderate malnutrition, and severe malnutrition.
2. The Pittsburgh Sleep Quality Index (PSQI) (Hinz et al.,2017) was used to assess the sleep quality of patients. The higher PSQI score indicates worse sleep quality. The Conner-Davidson Resilience Scale (CD-RISC) (Shin et al.,2018) was used to measure the patient's psychological resilience. The higher CD-RISC score indicates better psychological resilience.
3. The Hamilton Anxiety Scale (HAMA) and Hamilton Depression Scale (HAMD) (Zimmerman et al.,2017) were used to evaluate the negative

emotions of patients before and after nursing. The higher HAMA/HAMD score indicates higher anxiety/depression degree.
4. The Exercise of Self-Care Agency (ESCA) (Lau et al.,2014) was used to assess the self-care ability of patients, including four dimensions: health knowledge, self-care responsibility, self-care skills, and self-concept. The higher total score indicates stronger self-care ability.
5. The Quality of Life Questionnaire-Core 30 (QLQ-C30) (Singer et al.,2009) was used to assess the quality of life of patients before and after nursing, including 5 dimensions: role functioning (RF), emotional functioning (EF), cognitive functioning (CF), social functioning (SF), and physical functioning (PF). The higher total score indicates better quality of life.

1.4 Statistical analysis

In this study, data analysis and visualization were performed on GraphPad Prism 7 (GraphPad Software Inc., San Diego, CA, USA). The count data were represented by the number of cases/percentages [n (%)] and their intergroup comparison was analyzed by the chi-square test. The measurement data were represented by the mean ± standard deviation ($\bar{x}$ ± sd) and their intergroup comparison was analyzed by the t-test. The comparison between before and post nursing was analyzed by the repeated measurement ANOVA. The LSD-t test was used for the post-hoc analysis. $P < 0.05$ indicates a statistical difference.

2. RESULTS

2.1 Nutritional status of patients in the two groups

Details of the nutritional status of patients in the two groups are shown in Table 2. The rate of good nutrition was higher in the research group than in the regular group, and the P-value was less than 0.05. The rate of malnutrition was markedly lower in the research group than in the regular group, and the P-value was less than 0.05.

Table 2. **Comparison of the nutritional status of patients [n (%)]**

	Good nutrition	**mild and moderate malnutrition**	**Severe malnutrition**
Research group (n = 52)	30 (57.69)	18 (34.62)	4 (7.69)
Regular group (n = 49)	16 (32.65)	22 (44.90)	11 (22.45)
X^2	6.377	1.115	4.344
P	0.012	0.291	0.037

2.2 Sleep quality and psychological resilience of patients in the two groups

As shown in Figure 1, there were no notable differences between the two groups before nursing in the PSQI and CD-RISC scores, and the P-value was higher than 0.05. After nursing, the sleep quality

and psychological resilience of patients markedly improved in both groups. Compared to the regular group, the research group had lower PSQI scores and higher CD-RISC scores, and the P-value was less than 0.05.
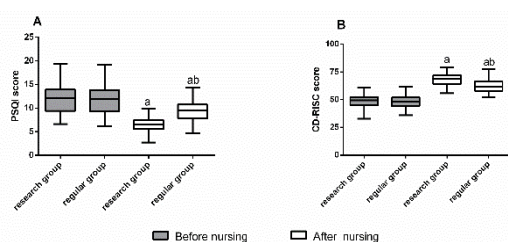
Figure 1. **Sleep quality and psychological resilience of patients in the two group. A. PSQI scores in the two groups before and after nursing. B. CD-RISC scores in the two groups before and after nursing.**

Note: "a" indicates aP < 0.05 when compared with the data before nursing within the same group. "b"

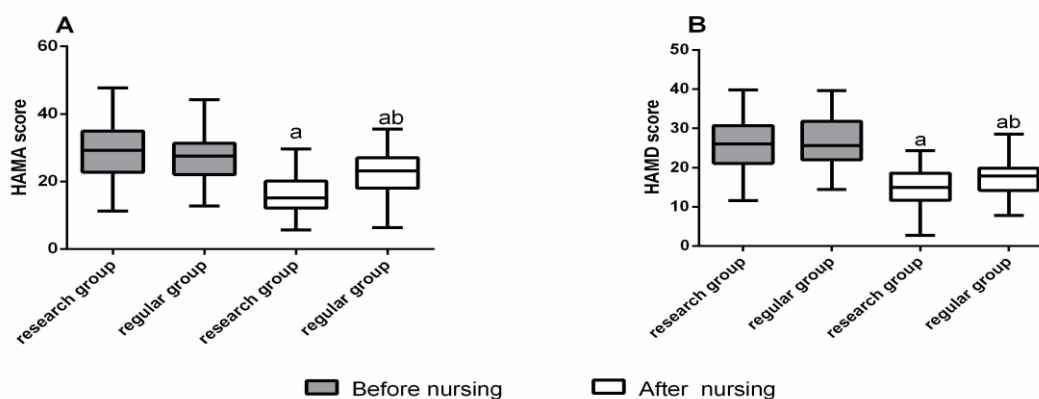indicates bP < 0.05 when compared with the data in the research group after nursing.

2.3 Negative emotions of patients in the two groups

Details of negative emotions of patients in the two groups before and after nursing are shown in Figure 2. The two groups were not markedly different in the HAMA and HAMD scores before nursing, and the P-value was higher than 0.05. After nursing, the HAMA and HAMD scores markedly decreased in both groups. The research group had lower HAMA and HAMD scores than the regular group after nursing, and the P-value was less than 0.05.

Figure 2. **Scores of negative emotions of patients in the two groups. A. HAMA scores in the two groups before and after nursing. B. HAMD scores in the two groups before and after nursing.**
Note: "a" indicates aP < 0.05 when compared with the data before nursing within the same group. "b" indicates bP < 0.05 when compared with the data in the research group after nursing.

2.4 Self-care ability of patients in the two groups

The self-care ability of patients was assessed by the ESCA scale from four dimensions (health knowledge, self-care responsibility, self-care skills, and self-concept), and more details are shown in Table 3. There were no notable differences between the two groups in the four dimensions before nursing, and the P-value was higher than 0.05. After nursing, the scores of the four dimensions increased in both groups, with higher scores in the research group than in the regular group, and the P-value was less than 0.05.

Table 3. **Scores of the four dimensions of self-care ability in the two groups ($\bar{x}$±sd)**

	Health knowledge	Self-care responsibility	Self-care skills	Self-esteem
Research group (n = 52)				
Before nursing	23.12 ± 4.76	18.23 ± 6.37	16.97 ± 3.97	20.18 ± 4.37
After nursing	38.18 ± 4.09	32.58 ± 7.28	34.11 ± 3.26	28.87 ± 4.86
t	17.370	11.000	22.970	9.569
P	< 0.05	< 0.05	< 0.05	< 0.05
Regular group (n = 49)				
Before nursing	22.67 ± 4.53	18.34 ± 6.18	17.08 ± 3.77	20.71 ± 4.56
After nursing	30.87 ± 4.27[b]	27.37 ± 6.71[b]	28.78 ± 4.18[b]	23.48 ± 4.72[b]
t	9.182	6.717	15.220	2.961
P	< 0.05	< 0.05	< 0.05	< 0.05

"b" indicates bP < 0.05 when compared with data in the research group after nursing.

2.5 Quality of life of patients in the two groups

The QLQ-C30 scores of patients before and after nursing in the two groups are shown in Figure 3. Before nursing, the two groups showed no differences in scores of RFs, EF, CF, SF, PF, and the P-value was higher than 0.05. After nursing, the scores of RF, EF, CF, SF, and PF increased in both groups, with higher scores in the research group than in the regular group, and the P-value was less than 0.05.
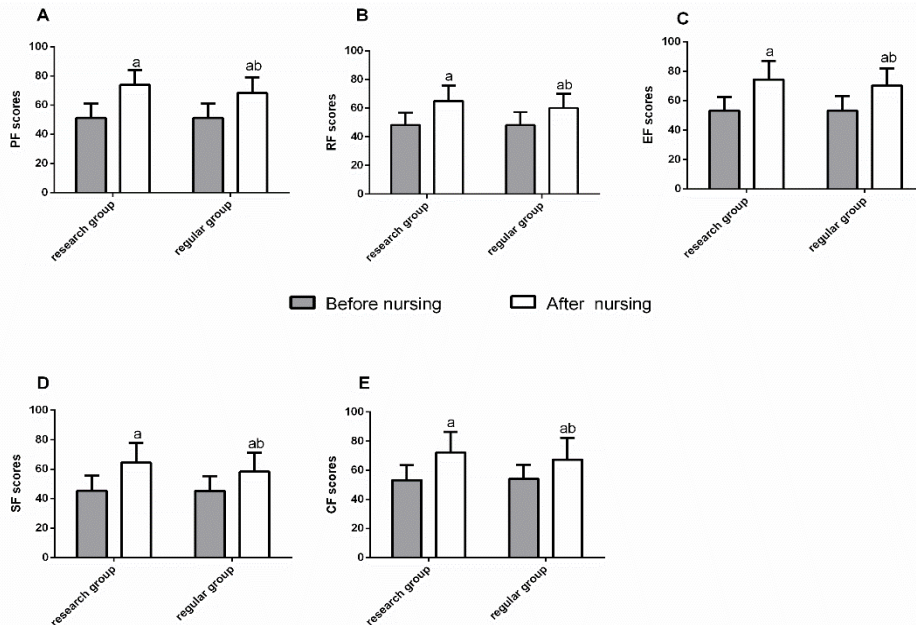

Figure 3. **Quality of life of patients in the two groups. A. PF scores in the two groups before and after nursing. B. RF scores in the two groups before and after nursing. C. EF scores in the two groups before and after nursing. D. SF scores in the two groups before and after nursing. E. CF scores in the two groups before and after nursing.**

Note: "a" indicates aP < 0.05 when compared with the data before nursing within the same group. "b" indicates bP < 0.05 when compared with the data in the research group after nursing.

2.6 Nursing compliance of patients in the two groups

Details of the nursing compliance of patients in the two groups are shown in Table 4. The nursing compliance rate was higher in the research group than in the regular group (96.15% vs. 83.67%), and the P-value was less than 0.05.

Table 4. **Treatment compliance in the two groups [n (%)]**

	Complete compliance	Partial compliance	Noncompliance	Nursing compliance rate
Research group (n = 52)	27 (51.92)	23 (44.23)	2 (3.85)	96.15%
Regular group (n = 49)	17 (34.69)	24 (48.98)	8 (16.33)	83.67%
X^2				4.405
P				0.036

2.7 Patient satisfaction in nursing in the two groups

Patient satisfaction in nursing was analyzed by the satisfaction questionnaire made by our hospital, and more details are shown in Table 5. In the research group, 3 patients expressed dissatisfaction with the nursing work, with a satisfaction rate of 94.23%. In the regular group, 10 patients expressed dissatisfaction with the nursing work, with a satisfaction rate of 70.59%. The overall nursing satisfaction rate was markedly higher in the research group than in the regular group, and the P-value was less than 0.05.

Table 5. **Nursing satisfaction in the two groups [n (%)]**

	Great satisfaction	Moderate satisfaction	Dissatisfaction	Satisfaction level
Research group (n = 52)	30 (57.69)	19 (36.54)	3 (5.77)	94.23%
Regular group (n = 49)	12 (24.49)	27 (55.10)	10 (20.41)	79.59%
X^2				4.821
P				0.028

3 DISCUSSION

The larynx regulates important physiological functions of the human body, including breathing, swallowing, and pronunciation(Calvas et al.,2017). Partial or complete laryngectomy may damage the anatomical structure, impair the language functions. and destroy the body appearance, posing a serious psychological and physiological burden on patients(Batıoğlu-Karaaltın et al.,2017;Polat et al.,2015). In recent years, nursing interventions have been proved to be effective in controlling the progression of LC, attracting extensive public attention.

Patients with LC are vulnerable to malnutrition due to limited food intake after surgery, which may even impair the immunity and hinder the recovery process of patients in severe cases(Mattioli et al.,2015). SGA is the most effective tool for determining the nutritional status of patients with LC. The possibility of malnutrition is high in the larynx and oral cavity(Zhiyan et al.,2017). Here we measured the nutritional status of all patients and discovered a higher rate of good nutrition in research group than in the regular group. Such results suggest that continuous nursing care can guide the postoperative diet arrangement and introduce nutritional knowledge based on the condition of patients and the rich nursing experience of nurses. After hospital discharge, staff responsible for the continuous will regularly follow up patients and adjust the diet plan to improve the nutritional status and the body immunity. LC patients receiving surgery often suffer from sleep disturbance and pain, which seriously affects the quality of life of patients (Boscolo-Rizzo et al.,2008). A previous study suggests that proper rehabilitation care can improve the sleep quality and reduce the PSQI score of stroke patients(Zhiyan et al.,2017). CD-RISC, the most widely used scale to evaluate psychological resilience, is suitable and effective for the psychological measurement of cancer patients, and the higher psychological resilience indicates more positive and active responses to crisis(Alarcón et al.,2020). Here we also measured the sleep quality of patients using the PSQI scale. After nursing, the sleep quality and psychological resilience improved in both groups, with more marked improvements in patients receiving the continuous nursing care. Staff of the continuous

nursing care analyzed the psychological characteristics of patients and took appropriate measures to relieve the psychological burden, anxiety, and stress of patients and reduce the pain intensity. Besides, staff introduced successful cases to boost the self-confidence of patients and guided them to follow reasonable daily routine. So here the continuous nursing care effectively improved the sleep quality of patients and enhanced their psychological resistance. Severe pain, adverse reactions, and surgical stress make an immediate speech after surgery impossible, what's worse, emergency situations will cause anxiety, pessimism, depression, and low confidence in recovery, which damages the postoperative recovery(Batıoğlu-Karaaltın et al.,2017;Polat et al.,2015). The study by Han and his colleagues (Han et al.,2018)revealed that health education can improve the quality of life of patients with LC and reduce their negative emotions. In the study by Li and his colleagues(Li et al.,2017), the HAMA and HAMD scores of LC patients markedly decreased after the psychological intervention. Here we used the HAMA and HAMD scores to assess the negative emotions of patients. After nursing, the degree of anxiety and depression decreased in both groups. The decline in the anxiety and depression degree was sharper in patients in the research group since staff responsible for the continuous nursing care closely monitored the psychological state of patients, eased the negative emotions in a targeted way, and enlightened patients with joint efforts from their family members to reduce the psychological burden of patients.

At present, more and more nursing services emphasize the subjective initiative of patients and nursing staff in the nursing process and suggest that the improvement of self-care ability can improve the quality of nursing(Aslani et al.,2016;Lee et al.,2018). Self-care can enhance the psychological and physiological sense of security of patients, improve the confidence in recovery, strengthen the relationship between doctors and patients, and remarkably promote the recovery of diseases. Here we assessed the self-care ability of patients with the ESCA scale from four dimensions. The scores of the four dimensions of self-care ability were higher in

patients receiving the continuous nursing care than in patients receiving the conventional nursing care. Staff for the continuous nursing care detailed the health knowledge and surgical precautions repeatedly to deepen the patient's mastery of the treatment information. Besides, continuous nursing staff regularly followed up patients and introduced the recovery progress and daily precautions at each visit to improve the patient's self-care awareness and skills and boost their confidence in recovery. The quality of life reflects the recovery of patients after treatment(Hamaker et al.,2017). A previous study suggests that self-care education can improve the quality of life of patients with gastrointestinal cancer receiving chemotherapy(Xie et al.,2020). Here we used the QLQ-C30 to assess the quality of life of all patients before and after nursing. The quality of life of patients improved in both groups after nursing, and the improvement was more marked in patients receiving the continuous nursing care. We found that the continuous nursing care can significantly enhance the treatment compliance of elderly LC patients undergoing surgery and lead to a high level of patient satisfaction in nursing. Staff for the continuous nursing care provided effective guidance for patients' daily routine, diet plan, and recovery training to improve the SF and PF of patients. Family members of patients were also engaged in nursing to ease negative emotions of patients and relieve their psychological burden. Besides, staff for the continuous nursing care maintained a good relationship with patients to facilitate the nursing work, enhance nursing compliance, and improve the medical experience.

This study explored the application of continuous nursing care in elderly LC patients undergoing surgery in many aspects. However, we did not compare the recovery of the phonatory function between patients receiving different nursing modes, nor did we analyze the effects of the family members and the financial situation of patients. So, the clinical application of continuous nursing care needs to be further studied.

In summary, continuous nursing care can markedly enhance the self-care ability, nursing compliance, and postoperative quality of life of elderly LC patients undergoing laryngectomy.

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