Application Value of Early Warning Nursing Model with "Evidence-based Concept" as the Core in Peri-anesthesia Period for Gastric Cancer

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ABSTRACT

Objective • To assess the effectiveness of an evidence-based early warning nursing model in reducing postoperative complications and enhancing care satisfaction for gastric cancer (GC) patients undergoing elective surgery.

Methods • A retrospective analysis was performed on patients who received laparoscopic assisted radical gastrectomy in Tumor Hospital Affiliated To Nantong University from January 2020 to January 2022 as the research subjects. According to the anesthesia plan, the patients were divided into a comprehensive (intervention plans that received an early warning care model centered on evidence-based concepts) and a conventional group (routine evidence-based nursing plan). The postoperative anesthesia recovery, complications, pain level at 24 hours after surgery, anxiety at different times after surgery, and nursing satisfaction were compared between the two groups.

Results • The postoperative spontaneous breathing time, consciousness recovery time, tracheal removal time, and defecation recovery time in the patients who received the early warning nursing based on the evidence-based concept were lower than those receiving only evidence-based care ($P < .05$). The total incidence of postoperative complications in the patients who received the early warning nursing based on the evidence-based concept were lower than those receiving only evidence-based care ($P < .05$). The postoperative pain levels of patients receiving the early warning nursing model were significantly lower than those receiving only evidence-based care ($Z = -2.199$, $P = .028$). After the intervention of different peri-anesthesia nursing modes, the anxiety scores of the two groups showed a downward trend with time ($F_{time} = 8.552$, $P_{time} < .05$), and the decrease in the comprehensive were greater than that in the routine group ($F_{groups} = 135.100$, $P_{time} < .05$), and there were no interaction ($F_{interaction} = 2.424$, $P_{interaction} < .05$). Patients in the group that received the comprehensive early warning nursing model had significantly higher satisfaction with peri-anesthesia care compared to those receiving only evidence-based care ($Z = -1.965$, $P < .05$).

Conclusion • Under the evidence-based early warning nursing model, nurses accurately assess patients' conditions during the peri-anesthesia period, leading to improved care plans that reduce complications and postoperative pain while enhancing patient satisfaction. (*Altern Ther Health Med.* 2023;29(8):613-617).

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INTRODUCTION

Gastric cancer is a malignant tumor that occurs in the gastric mucosal epithelium. Its pathogenesis is similar to that of most malignant tumors. Cancer cells accumulate and grow into tumors in the stomach's inner layer.[1,2] According to the global cancer data released in 2021, by 2020, the incidence and mortality of gastric cancer will rank fifth and fourth in the incidence and mortality of malignant tumors, accounting for 5.6% and 7.7%, respectively.[3-5] The occurrence of gastric cancer is the result of a combination of genetics and the environment, and the occurrence of gastric cancer is closely related to factors such as age, gender, and living environment.[6-8] The incidence of gastric cancer in men over the age of 50 is approximately twice that of women in the same age group, and the incidence of gastric cancer in rural areas is higher than that in urban areas.[9,10] With the aging of the world population and changes in people's living habits, the incidence of gastric cancer is still rising worldwide.

Surgery is the main treatment method for gastric cancer, and gastric cancer surgery includes radical surgery and non-radical surgery.[11,12] Radical surgery mainly refers to the need

for complete resection of the primary lesion and the dissection of regional metastatic lymph nodes, so as to achieve the purpose of a radical operation. Non radical surgery, also known as palliative surgery, refers to the partial resection of cancer tissue or simple gastrojejunal anastomosis, in order to reduce clinical symptoms and solve dietary problems. But no matter what kind of surgery, it is inseparable from the support of anesthesia. Anesthesia is an important part of surgical treatment. The quality of anesthesia is not only related to the smooth operation of patients but also has an important impact on the physiology and psychology of patients after surgery. Perianesthesia Nursing refers to the nursing around the whole anesthesia process, including pre-anesthesia assessment, implementation of the anesthesia plan, intraoperative anesthesia maintenance, and postoperative anesthesia recovery.[13-15] In this process, nursing staff implement nursing measures through a series of assessments and diagnoses and evaluate whether patients have physical problems, psychological problems, high-risk complications, etc., caused by the use of anesthesia drugs or anesthesia techniques after surgery. During surgery, the patient needs an injection of anesthesia. After the injection of anesthetic drugs, patients are in a state of deep sleep, and some patients have multiple diseases, which are prone to complications or adverse reactions during the perioperative period. Safe and effective nursing assistance during the peri-anesthesia period is particularly important. Only by ensuring the safety of patients during the peri-anesthesia period and eliminating possible risks and hidden dangers can the life safety of patients be further protected.

Evidence-based nursing is a nursing model that has been influenced by clinical evidence-based medicine with the emergence and development of evidence-based medicine in recent years.[16-18] Evidence-based nursing model, as an innovative nursing model, is good at formulating nursing plans based on common clinical nursing problems and combining clinical professional knowledge and patient needs. Early warning nursing refers to the comprehensive analysis and judgment of the patient's safety by nursing staff using nursing procedures, predicting possible nursing risks in advance, attaching great importance to and observing the early signs of patients to take appropriate medical and nursing prevention measures in time to avoid complications. It is a nursing model to improve the treatment effect.[19,20] Early warning nursing is active defensive nursing that can better reflect nursing care's value. This study aims to assess the application of an early warning nursing model centered on evidence-based concepts during the peri-anesthesia period of gastric cancer patients undergoing elective surgery.

MATERIALS AND METHODS
General information

Using a retrospective analysis method, patients with gastric cancer underwent surgical treatment from January 2020 to January 2022 were selected for the study. Inclusion criteria: (1) The diagnosis of gastric cancer was confirmed by gastroscope and biopsy; (2) The treatment method was surgery; (3) There was no contraindication to anesthesia; (4) There were complete data required for this study. Exclusion criteria: (1) Associated with distant metastasis of malignant tumor in other parts or gastric cancer; (2) Insufficiency of vital organs such as heart, brain, liver, and kidney; (3) Associated with mental disorders. 100 patients underwent gastroscopy and pathological examinations to confirm gastric malignant tumors, 20 cases of tumors located in the fundus or cardia, 31 cases of gastric angle, and 49 cases of gastric antrum and pylorus. Among them, 26 were poorly differentiated adenocarcinoma, 32 were moderately differentiated adenocarcinoma, and 42 were well-differentiated adenocarcinoma. According to the tumor site, 47 cases of laparoscopic radical distal gastrectomy, 37 cases of laparoscopic radical proximal gastrectomy, and 16 cases of laparoscopic radical total gastrectomy were performed. According to the different peri-anesthesia nursing methods, the research subjects were divided into the conventional (50 cases) and the comprehensive group (50 cases). From the statistical results in Table 1, it can be seen that the baseline data of the two groups of patients will not greatly impact the intervention results.

Table 1. General information of patients with different nursing modes

group	male/female	Age (year)	Course (month)	Surgical approach		
				distal gastrectomy	proximal gastrectomy	radical total gastrectomy
Conventional (n = 50)	28 (56.00)/ 22 (44.00)	68.29 ± 6.09	5.16 ± 1.44	22 (44.00)	20 (40.00)	9 (18.00)
Comprehensive (n = 50)	30 (60.00)/ 20 (40.00)	69.44 ± 5.84	5.61 ± 1.37	25 (50.00)	17 (34.00)	7 (14.00)
t/χ^2	0.164	0.964	1.601	0.645		
P value	.685	.338	.113	.724		

Nursing methods

The patients in the conventional group received the intervention of the routine evidence-based nursing mode: an evidence-based nursing team was formed before the operation, and the team members conducted a detailed analysis according to the progress of the patient's condition and formulated a targeted, evidence-based nursing intervention plan. During the operation, the ECG monitoring of the patient is performed while the pupil changes, physical examination changes, blood pressure changes, etc. of the patient after anesthesia are observed. Actively maintain the patient's unobstructed venous channel, properly fix the drainage tube, and ensure smooth drainage. Combined with the patient's actual situation, the drainage tube can be attached to the bedside to effectively prevent the drainage tube from loosening. Strengthen the patient's warm work and skin cleaning work to avoid pressure injury.

The patients in the comprehensive group received the early warning nursing mode intervention centered on the evidence-based concept: Early-warning nursing based on the conventional group: The patient's disease condition and psychological state are based on the corresponding nursing measures before surgery. If the patient's self-control is weak,

Zhou—Early Warning Nursing Model for Gastric Cancer Anesthesia

targeted psychological counseling can be given to help the patient adjust their psychological state. During the operation, the nurses make a predictive analysis based on the surgical process, the operator's surgical habits, intraoperative-related matters, and clinical personal nursing work experience, and carry out effective intraoperative nursing to avoid or reduce the occurrence of intraoperative accidents. One day before the operation, the nursing staff visited the patient before operation. It patiently introduced the anesthesia purpose, method, requirements and possible discomfort of gastric cancer surgery to the patient and their family members. During the anesthesia process, pay close attention to the changes of the patient's vital signs and conditions, report to the surgeon if any abnormality is found, and cooperate with the doctor to intervene accordingly. Early warning of physiological, drug, and psychological care for patients after operation. Physiological care includes control of fluid input, management of indwelling catheters, and postoperative nutritional guidance. Medical care includes temperature and position management, postoperative pain management, and postoperative bleeding management. Postoperative psychological care is mainly to relieve patients' tension after surgery, reduce the psychological burden of patients after surgery, and promote postoperative recovery.

Observation indicators

A number of indicators in the peri-anesthesia period of the two groups of patients were detected and compared. (1) Anesthesia recovery: spontaneous breathing time, consciousness recovery time, tracheal removal time, and defecation recovery time after stopping anesthesia. (2) Postoperative complications: wound infection, lower extremity edema, intestinal obstruction, lower extremity venous thrombosis, fever, vomiting, etc. (3) Pain level at 24 hours after operation: level 0: almost no pain or only slight pain after the operation, and sleep is not affected; level 1: obvious pain after the operation, but not affecting sleep; level 2: surgery Postoperative pain is obvious, affecting normal sleep; grade 3: postoperative pain is severe, seriously affecting sleep and normal life. (4) Anxiety: Self-Rating Anxiety Scale (SAS)[21] was used to evaluate patients' anxiety on admission, 2 hours before surgery, 2 hours after surgery, and 12 hours after surgery. SAS adopts a 4-level rating system, which mainly evaluates the frequency of symptom occurrence. The standard is: "1" indicates no or very little time; '2' indicates sometimes; '3' indicates most of the time; '4' means most or all of the time. The main statistical indicator of SAS is the total score. Add up the scores of 20 items to obtain a rough score; Multiply the rough score by 1.25 and take the integer part to obtain the standard score. SAS ranges from 0 to 100 points, and scores >50 indicate anxiety, and the higher the score, the more severe the anxiety. (5) Nursing satisfaction: A self-made nursing satisfaction questionnaire was used to investigate patients' satisfaction with peri-anesthesia nursing (Including the evaluation of nursing skills, nursing attitude and nursing effect of nursing staff) The satisfaction was divided into four levels: very satisfied, very satisfied, basically satisfied, and not very satisfied.

Table 2. Comparison of postoperative anesthesia recovery

group	n	postoperative spontaneous breathing time (min)	consciousness recovery time (min)	tracheal removal time (min)	defecation recovery time (d)
Conventional	50	10.21 ± 2.03	16.92 ± 2.16	17.67 ± 2.51	4.96 ± 0.59
Comprehensive	50	8.87 ± 1.81	15.33 ± 2.41	16.01 ± 2.33	3.62 ± 0.47
t		3.484	10.030	3.427	12.560
P value		<0.001	<.001	<.001	<.001

Table 3. Comparison of postoperative complications

group	n	wound infection (%)	lower extremity edema (%)	intestinal obstruction (%)	total incidence (%)
Conventional	50	6	3	2	14
Comprehensive	50	3	1	1	5
χ^2					5.263
value					.022

Statistical analysis

Statistic Package for Social Science (SPSS) 25 (IBM, Armonk, NY, USA) and GraphPad 8.3 (La Jolla, CA, USA) statistical software were used to analyze the data of this study. Quantitative data conforming to a normal distribution were expressed as ($\bar{x} \pm s$), differences between groups were analyzed by t test, and multi-period comparisons between groups were performed by repeated measures ANOVA. Categorical data were represented by n (%), χ^2 test was used to compare two groups, and rank sum test was used for rank data. The data comparison indicated that the difference was significant at $P < .05$.

RESULTS

Postoperative anesthesia recovery of the two groups

The postoperative anesthesia recovery of the two groups of patients was compared, and it was found that the postoperative spontaneous breathing time, consciousness recovery time, tracheal removal time, and defecation recovery time of the patients who received the early warning nursing based on evidence-based concept were all lower than those receiving only evidence-based care ($P < .05$), as shown in Table 2.

Postoperative complications in the two groups

As shown in Table 3 below, the incidences of postoperative wound infection, lower extremity edema and intestinal obstruction in the comprehensive group were lower than those receiving only evidence-based care. The statistics and comparison of total complications, including lower extremity venous thrombosis, fever, vomiting and other complications, showed that the total complication rate in the patients who received the early warning nursing based on the evidence-based concept was significantly lower than those receiving only evidence-based care ($P < .05$).

Comparison of postoperative pain levels

As shown in the rank sum test results in Table 4 below, the postoperative pain degree of patients who received early warning care based on evidence-based concepts was

**Table 4.** Comparison of pain levels [n(%)]

group	n	Grade 0	Grade 1	Grade 2	Grade 3
Conventional	50	3	17	25	5
Comprehensive	50	7	23	18	2
Z		-2.199			
P value		.028			

Table 5. Comparison of anxiety status of patients at different times

group	At admission	Preoperative 2 h	Postoperation 2 h	Postoperation 12 h
Conventional (n = 50)	61.12 ± 6.15	56.28±5.32	53.09 ± 4.31	49.62 ± 3.05
Comprehensive (n = 50)	61.91 ± 6.08	54.26±5.16	51.26 ± 3.97	47.08 ± 3.16
F_{groups}	135.100	P_{groups}	<.001	
F_{time}	8.552	P_{time}	.004	
$F_{interaction}$	2.424	$P_{interaction}$	.065	

Table 6. Comparison of nursing satisfaction

group	n	Very satisfied	Quite satisfied	Basically satisfied	Not so satisfied
Conventional	50	25	12	9	4
Comprehensive	50	32	15	2	1
Z		-1.965			
P value		.049			

Figure 1. Comparison of anxiety in two groups at different times
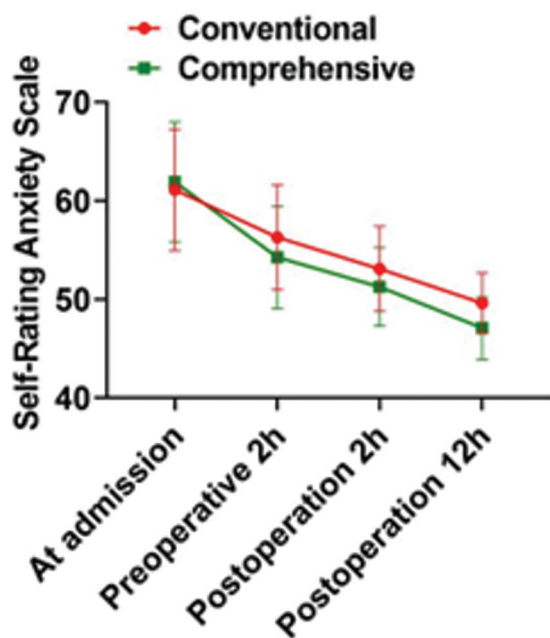
significantly lower than that of patients who received only evidence-based care (Z=-2.199, P=0.028).

Comparison of anxiety in two groups of patients at different times

On admission, the SAS scores of both groups were >50, and the scores were similar. After the intervention of different peri-anesthesia nursing modes, the anxiety scores of the two groups showed a downward trend with time (F_{time} = 8.552, P_{time} = .004). The decrease in the comprehensive was greater than that in the routine group (F groups = 135.100, P_{time} < .001). There was no interaction ($F_{interaction}$ = 2.424, $P_{interaction}$ = .065), as shown in Table 5 and Figure 1.

Nursing satisfaction

The rank sum test results indicated that the patients who received the early warning nursing model centered on the evidence-based concept were significantly more satisfied with the peri-anesthesia care than the routine group (Z = -1.965, P < .05), as shown in Table 6.

DISCUSSION

Surgery is a traumatic treatment method, and anesthesia is an indispensable part of the surgery. During the peri-anesthesia period, patients will inevitably have fear of anesthesia, resulting in a certain degree of physical and psychological stress. This affects the surgical results and increases the risk of postoperative complications. Effective peri-anesthesia nursing intervention can significantly improve the effect of anesthesia in the operating room and improve the safety of surgery. With people's increasing emphasis on physical health, people's requirements for nursing intervention in the operating room are not limited to the cooperation with the doctor on the operating table but hope that the operating room nurses can provide more scientific and better quality and more comprehensive care services. So that the patient can face the operation and cooperate with the treatment in the best psychological and physiological state. Evidence-based nursing takes "clinical practice ability" and "problems encountered in nursing" as the core. It combines clinical nurses' professional knowledge and clinical nursing work experience to enhance the nursing staff's ability to deal with emergencies in the nursing process.[22,23] Early warning nursing is to make effective predictions and judgments about possible related situations during the peri-anesthesia period and take precautions based on the relevant examination results of the patients, the disease conditions of the patients, and the nursing staff's familiarity with the anesthesia process [24,25]

In this study, the postoperative spontaneous breathing time, consciousness recovery time, tracheal removal time, defecation recovery time, and the incidence of postoperative complications of gastric cancer patients who received the early warning nursing model centered on the concept of evidence inquiry were all lower in the regular group. After the operation, the effect of anesthesia has not disappeared, the main function of the patient's body has not been restored, and the state of the body is still unstable. During this period, early-warning nursing with evidence-based concept as the core can carry out targeted interventions on patients from multiple aspects, such as physiological nursing, drug nursing, and psychological nursing, to promote postoperative patient recovery. Scholars such as Kent[26] analyzed the evidence-based concept of predictive nursing to help nurses make clinical decisions, thereby improving the nursing effect of patients. Incision pain is unavoidable after surgical treatment. In this study, when comparing the postoperative pain level of patients, it was found that the postoperative pain degree of patients who received evidence-based early warning care was significantly lower than that of patients in the conventional group.

Negative emotions during the peri-anesthesia period have an important impact on patients' surgical outcomes and postoperative rehabilitation. Scholars such as Araya[27] stated in their research that the effect of surgical treatment of cancer patients with depression is poor, and suggested necessary preoperative psychological counseling for cancer patients. Pazar[28] also indicated in the study that invasiveness is easy to cause stress in patients, and if negative emotions of anxiety accompany the patient, it will affect the intervention effect. When the subjects of this study were admitted to the hospital, the SAS scores of the patients receiving different interventions were all >50 points, and the scores were similar, indicating that the vast majority of the patients in the two groups were in a state of anxiety when they were admitted to the hospital. After the intervention of different peri-anesthesia nursing modes, the anxiety scores of the two groups showed a downward trend with the progress of time, and the decrease in the comprehensive group was greater than that in the routine group. These findings indicate that early-warning nursing based on evidence-based concepts can reduce perioperative anxiety in gastric cancer patients. In addition, this study also found that a nursing model centered on the concept of evidence enquiry can improve the satisfaction of gastric cancer patients with nursing. However, there is still a shortage of small sample size in this study. We hope to conduct larger sample studies in the future to further confirm the reliability of this research result.

CONCLUSION

The early warning nursing model based on evidence inquiry can accurately assess the patient's condition during the peri-anesthesia period, adopt the most suitable nursing plan, and effectively warn of the occurrence of complications and formulate an intervention plan in advance. These nursing programs can reduce peri-anesthesia complications, reduce postoperative pain, and improve patient care satisfaction. If this nursing scheme is promoted, more patients can benefit, which has a certain clinical practical value.

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