

Original Article

The application of standardized nursing assessment and intervention in reducing the incidence of unplanned extubation of gastric tube

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Abstract: Objective: The goal of this study was to explore the application of standardized nursing assessment and intervention in reducing the incidence of unplanned extubation of gastric tube. Methods: 100 patients with indwelling gastric tube admitted to our hospital from November 2018 to November 2019 were recruited, and according to the order of admission, they were divided into an experimental group and a control group, with 50 patients in each group. Patients in the control group received routine care, while patients in the experimental group received standardized care. The clinical indicators, incidence of slipping of the catheter, nursing disputes, complications, pain relief time and swelling relief time, unplanned extubation of the gastric tube, nursing and patient satisfaction rate, and extubation time were compared between the two groups. Results: The rates of success intubation and indwelling compliance in experimental group were higher than those in the control group ($P<0.05$). The experimental group exhibited smaller probability of catheter blockage compared with the control group ($P<0.05$). The incidence of complications was observed to be lower in the experimental group compared with the control group ($P<0.05$). We identified no statistical difference in catheter slippage and nursing disputes in the two groups ($P>0.05$). Regarding the 'nursing and patient satisfaction, the experimental group displayed significantly higher score in comparison with the control group ($P<0.05$). Furthermore, the extubation time, the pain relief time and swelling relief time in experimental group were found to be shorter ($P<0.05$). The unplanned gastric tube extubation rate of the experimental group was obviously lower than that of the control group's ($P<0.05$). Conclusion: The incidence of unplanned gastric extubation tube and occurrence of complications and unexpected situations of patients can be reduced significantly through standardized nursing evaluation and intervention, which should be widely promoted and adopted in clinical practice.

Keywords: Standardized nursing, evaluation and intervention, gastric tube, unplanned extubation

Introduction

Gastric tube technique that allows for patients who are unable to eat to meet their physiological needs is extensively applied. In case of necrotizing enterocolitis or intestinal obstruction, it necessitates intestines and stomach decompression and a gastric tube indwelling [1-3]. Gastric tube inserting steps for a patient are as follows. First manually insert the gastric tube into the esophagus through the patient's nostril or mouth, and then pass through the patient's throat and esophagus to reach the patient's stomach. Water and food can be pumped into

the patient's gastric tube through a piston or a pressurized syringe to ensure that patients can take in sufficient nutrition during treatment [4, 5]. Unplanned extubation refers to the removal of the catheter by the patient without the medical staff's consent, or the accidental fall of the catheter. The occurrence of unplanned extubation has a negative effect on the treatment effect, aggravates the patient's condition, and therefore seriously threatens the patient's life safety along with more hospitalization cost. Resetting of the gastric tube not only brings pain to the patient, but also may puncture the anastomosis and damages the patient's surgi-

cal area [6, 7]. This study was undertaken to further examine the role of standardized nursing evaluation and intervention in reducing the incidence of unplanned gastric tube extubation.

Materials and methods

Participants

100 patients with indwelling gastric tube admitted to our hospital from November 2018 to November 2019 were enrolled, and according to the order of admission, they were divided into two groups: experimental group and control group, with 50 patients in each group. The control group patients' age ranged from 31 to 72 years, with the average age of 56.39 ± 2.71 years. Among the 23 male patients and 27 female patients, 13 had acute gastric dilatation, 9 had upper gastrointestinal perforation, 12 had throat surgery, 5 had coma, and 11 who could not eat for other reasons. Ranging from 33 to 77 years old, patients in the experimental group had an average age of 57.16 ± 1.03 years. Among the 26 male patients and 24 female patients, 16 patients had acute gastric dilatation, 7 had upper gastrointestinal perforation, 14 had throat surgery, 4 had coma, and 9 who could not eat for other reasons. The baseline information in the two groups was not statistically different ($P > 0.05$).

Inclusion criteria: indications for gastric tube insertion are acute perforation of gastroduodenal ulcer, intestinal obstruction, pyloric stenosis or food poisoning, coma or extreme anorexia, intubation for nutritional therapy, etc. This study has been approved by the hospital's ethics committee. All patients and their families were aware of the purpose and methods of this study, and the patients' families signed an informed consent form and agreed to participate in this research.

Patients with drug contraindications, heart failure, severe respiratory failure, congenital heart disease, severe liver and kidney dysfunction were excluded from this research.

Methods

Routine nursing was given to patients in the control group. Based on the routine nursing received by the control group, standardized

care was also given to the patients in the experimental group. First of all, to train the medical staff on the knowledge of gastric tube intubation, a standardized professional nursing team composed of the head nurse and many experienced nursing staff was established, and the assessment of relevant nursing skills was strengthened [8-10]. During the intubation process, with the nurse's assistance the patient was put in a semi-sitting and lying position [11-13]. When the patient felt uncomfortable during the nostrils cleaning process, the nursing staff reported to the intubation doctor in time to pause for a while, and encouragement was given to the patient in time [14, 15]. Any existing nursing risks were promptly identified by nursing staff to reduce the occurrence of risk events. Combining the actual situation of the hospital, targeted nursing plans for patients were developed to improve the nursing process. The patient's condition was under close attention with regular nursing rounds. Disinfection during daily nursing work was carried out to avoid human factors that caused infections in patients.

Observation indicators

The clinical indicators, incidence of slipping of the catheter, nursing disputes, complications, pain relief time and swelling relief time, unplanned extubation of the gastric tube, nursing and patient satisfaction rate, and extubation time were compared between the two groups. Clinical indicators include intubation, catheterization compliance and catheter blockage. Complications include infection of the catheter port, esophageal varices, esophageal obstruction, upper gastrointestinal bleeding and so on. The gastric tube can be removed when independent feeding is available, and the extubation time was counted. Nursing and patient satisfaction = very satisfied rate + satisfied rate.

Statistical methods

In this study, all data were processed by SPSS21.0 software. All measurement data were calculated and examined for difference by t test, expressed as mean \pm standard deviation; All count data were uniformly tested for difference using χ^2 test, and given as (n, %). $P < 0.05$ was declared as statistically significant.

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Table 1. Comparison of clinical indicators between the two groups of patients [n (%)]

Groups	Number of cases	Intubation success rate	Tube indwelling compliance rate	Catheter blockage
Experimental group	50	92% (46/50)	96% (48/50)	4% (2/50)
Control group	50	74% (37/50)	80% (40/50)	18% (9/50)
χ^2		5.74	6.06	5.005
P		0.017	0.014	0.025

Table 2. Comparison of complications between the two groups [n (%)]

Groups	Number of cases	Catheter port infection	Esophageal varices	Esophageal obstruction	Upper gastrointestinal bleeding
Experimental group	50	2% (1/50)	2% (1/50)	0 (0/50)	4% (2/50)
Control group	50	12% (6/50)	14% (7/50)	8% (4/50)	18% (9/50)
χ^2		1.041	4.89	4.17	5.005
P		0.046	0.027	0.041	0.025

Table 3. Comparison of catheter slippage and nursing disputes between the two groups [n (%)]

Groups	Number of cases	Catheter slippage	Nursing disputes
Experimental group	50	0 (0/50)	0 (0/50)
Control group	50	4% (2/50)	4% (2/50)
χ^2		2.04	2.04
p		0.153	0.153

Results

Clinical indicators

Table 1 presents that the experimental group's success rate of intubation and indwelling compliance rate were higher than those in the control group ($P<0.05$); moreover, the odds of developing catheter blockage in the experimental group was found to be smaller compared with that in the control group ($P<0.05$).

Complications incidence

Table 2 displays that the experimental group exhibited lower incidence of complications when compared with the control group ($P<0.05$).

Catheter slippage and nursing disputes

Experimental group had no catheter slippage and nursing disputes, while the control group had two catheter slippages and two nursing disputes, yet the difference did not reach statistical significance ($P>0.05$), see **Table 3**.

Nursing and patient satisfaction

With regard to nursing and patient satisfaction, the experimental group was significantly superior to the control group ($P<0.05$). See **Table 4** for details.

Extubation time

Experimental group's extubation time was significantly shorter than that of the control group ($P<0.05$). See **Table 5**.

The pain relief and swelling relief time

The experimental group exhibited shorter pain relief time and swelling relief time as compared to the control group ($P<0.05$), see **Figure 1**.

Unplanned gastric tube extubation rates

Figure 2 shows that the unplanned gastric tube extubation rate of the experimental group was obviously lower than that of the control group ($P<0.05$).

Discussion

Indwelling gastric tube is perceived as an invasive operation, and accumulating evidence demonstrated that the nasogastric tube fixation outperforms the oral gastric tube [16-18]. Many patients are likely to choose nasal intubation, because oral gastric tube is prone to upper gastrointestinal hemorrhage, edema and many other uncomfortable symptoms. However, gastric tube dislocation or falling out may happen

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Table 4. Comparison of the nursing and patient satisfaction of the two groups of patients [n (%)]

Groups	Number of cases	Very satisfied	Satisfied	Dissatisfied	Total satisfaction rate
nursing satisfaction					
Experimental group	50	70% (35/50)	26% (13/50)	4% (2/50)	96% (48/50)
Control group	50	40% (20/50)	40% (20/50)	20% (10/50)	80% (40/50)
χ^2		9.09	2.216	6.06	6.06
p		0.003	0.137	0.014	0.014
patient satisfaction					
Experimental group	50	72% (36/50)	28% (14/50)	0 (0)	100 (100)
Control group	50	44% (22/50)	42% (21/50)	14% (7/50)	86% (43/50)
χ^2		9.17	2.233	8.06	7.527
p		0.004	0.117	0.005	0.006

Table 5. Comparison of the extubation time of the two groups of patients (h, $\bar{x} \pm s$)

Group	Number	Extubation time
Experimental group	50	56.3 \pm 2.4
Control group	50	60.23 \pm 3.6
t		4.76
P		<0.01

due to patients' poor endurance or inappropriate fixation of the tube [19]. In this regard, the effective nursing interventions are urgently needed to prevent problems as such. To reach a standardized nursing level and reduce the occurrence of unplanned extubation events rate, a professional nursing team should be set up first, team members should be trained with relevant knowledge, observation of the gastric tube should be meticulously carried out, and problems in the nursing process should be monitored and dealt with timely. Standardized care requires the evaluation of the patient's general information upon admission. Patient's self-care ability and treatment compliance can be improved through education of the relevant knowledge about gastric tube intubation.

The findings of the present study revealed that the experimental group's success rate of intubation and indwelling compliance rate were higher than those in the control group ($P < 0.05$); moreover, the odds of developing catheter blockage in the experimental group was found to be smaller compared with that in the control group ($P < 0.05$). It is extrapolated that standardized care has an incremental value beyond the routine care with regard to patient compliance with treatment and the intubation opera-

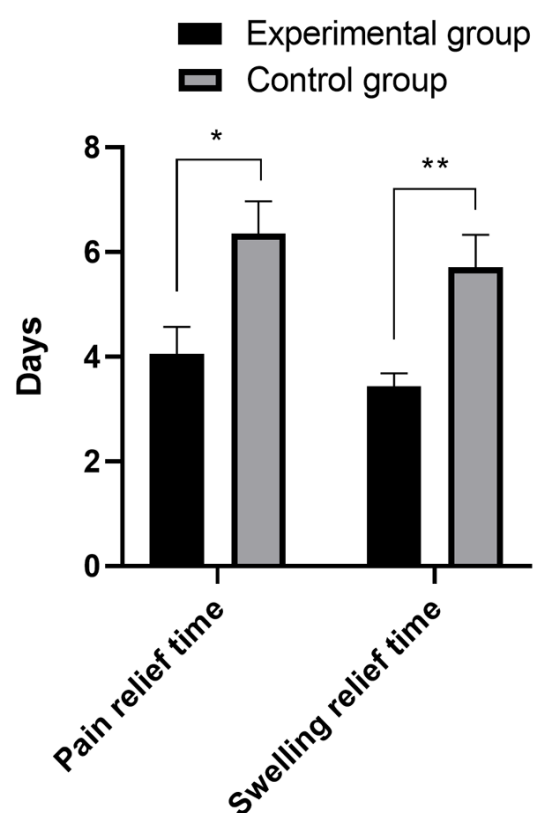


Figure 1. Comparison of pain relief time and swelling relief time between the two groups. Note: The horizontal axis represents pain relief time and swelling relief time; the vertical axis represents days. The pain relief time and swelling relief time of the experimental group were 4.06 \pm 0.51 d and 3.43 \pm 0.25 d, respectively; The pain relief time and limb swelling relief time of the control group were 6.35 \pm 0.62 d and 5.71 \pm 0.62 d, respectively. *indicates the significant difference in pain relief time between the experimental group and the control group ($t=20.17$; $P=0.000$). **indicates that there is a significant difference in swelling relief time between the experimental group and the control group ($t=24.11$; $P=0.000$).

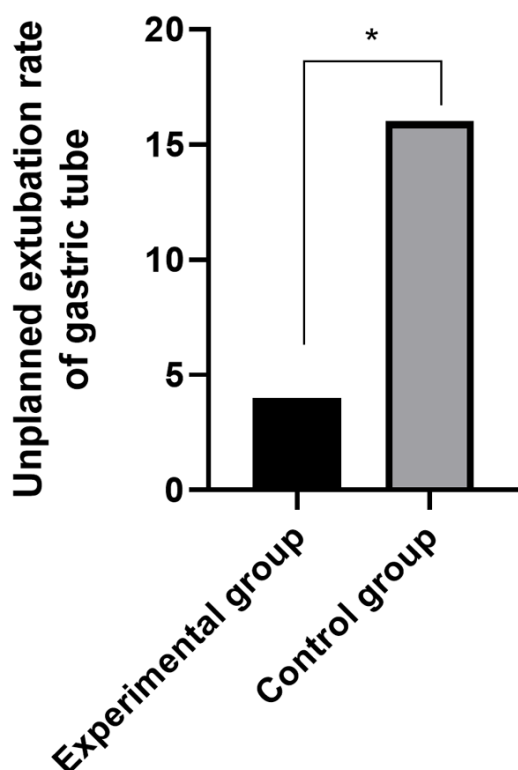


Figure 2. Comparison of the unplanned extubation rate of gastric tube between the two groups. Note: The horizontal axis represents groups, and the vertical axis represents the unplanned extubation rate of the gastric tube. The unplanned extubation rate of the gastric tube in the experimental group was 4%, and that in the control group was 16%. *indicates that there is a significant difference in the rate of unplanned extubation of the gastric tube between the experimental group and the control group ($\chi^2=4$; $P=0.046$).

tion. Notably, the experimental group exhibited lower incidence of complications when compared with the control group; and the experimental group had no catheter slippage and nursing disputes, while the control group had two catheter slippages and two nursing disputes. Additionally, with regard to nursing and patient satisfaction, the experimental group was significantly superior to the control group. Importantly, the experimental group's extubation time was demonstrated to be significantly shorter. Moreover, the pain relief time and swelling relief time in the experimental group were shorter than those of the control group, and the unplanned gastric tube extubation rate of the experimental group was obviously lower.

In keeping with prior report by Aydon et al. [20] wherein the incidence of unplanned extubation

in patients treated with standardized care was significantly lower than that in patients treated with conventional care, homogeneous results were garnered from the current study. However, the biased results may be yielded due to the absence of follow-up of patients' prognosis, and long-term follow-up is needed to observe their quality of life and psychology.

Given the above results, standardized nursing has a great potential to be a preferable method in terms of the unplanned extubation, complications and emergencies of patients, and nursing satisfaction.

Disclosure of conflict of interest

None.

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