Original Article
The application of evidence-based nursing in tube nursing after gastrointestinal surgery

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Abstract: Objective: To explore and analyze the application of evidence-based nursing (EBN) in tube nursing after gastrointestinal surgery, so as to determine its clinical effect and value in this field. Methods: Patients with indwelling catheters after gastrointestinal surgery were enrolled in this study and prospectively studied. They were divided into a control group treated with conventional nursing (n=43) and an experimental group treated with EBN combined with basic nursing (n=44) according to the odd-even type of enrollment. The effects of nursing, the extubation rates, oral comfort, the incidence of adverse reactions, and nursing satisfaction were assessed and compared between the two groups. Results: After the surgery, the rehabilitation effects of the different nursing methods were good. The effective rate of nursing in the control group was 81.40% (35/43), while the rate in the experimental group was 97.73% (43/44) (P<0.05). The accidental and unplanned extubation rates in the experimental group (2.27% and 4.55%) were significantly better than they were in the control group (18.60% and 20.93%) (P<0.05). Compared with the patients in the control group, the patients in the experimental group had a significantly better incidence of adverse reactions, oral comfort, and nursing satisfaction (all P<0.05). Conclusion: During the nursing of patients with an indwelling catheter after gastrointestinal surgery, EBN can decrease the patients’ extubation rates, improve their oral comfort and nursing satisfaction, and reduce their adverse reactions.

Keywords: Gastrointestinal surgery, evidence-based nursing, tube nursing, application analysis

Introduction

With the rapid development of science and technology and the acceleration of information dissemination in medical health and healthcare, people have difficulties in screening out the useful medical and health information from a large amount of information [1]. Initially proposed by Professor David Sackett, a well-known scholar, evidence-based nursing (EBN) emphasizes the importance to patients’ personal expectations and requires medical personnel to make clinical decisions prudently, clearly, and wisely by using the latest and best evidence [2, 3].

EBN holds that nursing staff should combine their experience with scientific evidence and patients’ expectations, and take clinical nursing practice as a reference and employ evidence-based practice, so as to nurse the patients. Widely concerned and recognized by the international medicine community, EBN is generally believed to be important for improving the effectiveness, safety, and economy of nursing [4, 5]. This nursing model was introduced to China at the end of the 20th century and has been widely used in orthopedics, cardiovascular surgery, neurosurgery, and gastrointestinal surgery. Compared with conventional nursing, EBN has significant advantages and a significantly high nursing satisfaction rate as judged by patients, so it has gradually become the gold standard for clinical nursing practice in China [6].

The gastrointestinal tract is an integral part of the human digestive system and one of the largest immune and detoxification organs of the human body, and it plays an important role in nutrition absorption. Gastrointestinal diseases are characterized by complex conditions and a rapid progression, and most patients with acute gastrointestinal diseases should be treated with surgery. After the surgery, a decompression tube is usually retained, so that
medical personnel can observe the patients' condition changes, make correct judgments, and remove effusion in the digestive tract in a timely manner [7-9]. During conventional tube nursing after gastrointestinal surgery, due to the pharyngeal stimulation by decompression, postoperative discomfort, or other influences, patients are prone to oral and throat inflammation as well as accidental or unplanned extubation, which affect the treatment. Therefore, improving nursing methods is essential for improving the postoperative efficacy. In this study, the patients were treated with EBN in order to explore and analyze its clinical effect and value in tube nursing after gastrointestinal surgery.

**Materials and methods**

**General information**

A total of 87 patients (42 males and 45 females) with indwelling catheters after gastrointestinal surgery in Qionghai City People's Hospital from December 2015 to December 2018 were enrolled in the study. They were divided into the control group (treated with conventional nursing, n=43) and the experimental group (treated with EBN combined with basic nursing, n=44) according to the odd-even type of enrollment. There were 30 cases of radical gastrectomy, 28 of radical resection of rectal carcinoma, 17 of total thyroidectomy, and 12 of gastric perforation repair. All the patients signed an informed consent form. This study was approved by the Ethics Committee of Qionghai City People's Hospital.

Inclusion criteria: patients older than 18 years old; patients undergoing gastrointestinal surgery in a stable condition and with a clear consciousness; patients who had not received radiotherapy, chemotherapy, or other surgeries before.

Exclusion criteria: patients with severe hepatic, nephric, cardiac, or pulmonary dysfunction; patients with communication disorders or mental diseases.

**Nursing methods**

The patients in the control group were treated with conventional nursing. Their vital signs were monitored in real time, and their oral mucosa and skin were regularly nursed. After admission, the nursing staff explained common diseases, carried out health education, and conducted conventional tube fixing and pressure ulcer nursing on the patients. The behavior of patients with anxiety was restricted by necessary measures to avoid any aggressive or self-injurious behavior on their part. The patients' bedding and clothing were regularly cleaned to ensure a hygienic environment [10].

The patients in the experimental group were treated with EBN combined with basic nursing, which mainly included assessing the patients' basic states, forming a special nursing team, and determining any nursing problems, as well as aggregating and searching the medical literature, and taking targeted measures. Specific steps were as follows: (1) The assessment of the patients' basic states. At the time of admission and treatment, the medical staff actively understood the patients' disease statuses, mastered their clinical manifestations, and preliminarily assessed their conditions. (2) The formation of a special nursing team. A special EBN team in this department was formed. The team members regularly organized training and assessment, and familiarized themselves with nursing contents, so that they could strengthen the awareness of nursing responsibility and understand the normative operation of nursing. (3) The proposal and determination of nursing problems. The members determined the main causes of accidental or unplanned extubation after gastrointestinal surgery, informed the patients the function and necessity of the postoperative indwelling catheter in advance, and reminded them of the possible factors for extubation. For example, accidental extubation may occur because of one's sleep state at night or discomfort. Meanwhile, the medical staff closely observed the specific condition of each patient, discovered deficiencies in the nursing in time, and then formulated and adjusted the corresponding nursing measures. (4) The learning and data and medical literature searching. The medical staff searched for data in a targeted way, and mastered the solutions to problems in their work. At the same time, they valued the problems raised by the patients and improved the awareness of predictive learning. They also provided valuable evidence for rational EBN and guided nursing methods and behavior from a more professional per-
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Table 1. Comparison of the general clinical information

<table>
<thead>
<tr>
<th>Group</th>
<th>Control group</th>
<th>Experimental group</th>
<th>t/X²/Z</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender (male/female)</td>
<td>22/21</td>
<td>20/24</td>
<td>0.284</td>
<td>0.594</td>
</tr>
<tr>
<td>Age (years)</td>
<td>34-72</td>
<td>37-73</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average age (years)</td>
<td>50.1±7.4</td>
<td>51.8±7.7</td>
<td>0.432</td>
<td>0.667</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>63.21±7.25</td>
<td>60.34±9.21</td>
<td>1.613</td>
<td>0.111</td>
</tr>
<tr>
<td>BMI</td>
<td>18.22±2.35</td>
<td>18.45±3.11</td>
<td>0.389</td>
<td>0.699</td>
</tr>
<tr>
<td>Type of operation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Radical gastrectomy</td>
<td>14</td>
<td>16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Radical resection of rectal carcinoma</td>
<td>13</td>
<td>15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total thyroidectomy</td>
<td>11</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gastric perforation repair</td>
<td>5</td>
<td>7</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: BMI, Body mass index.

Outcome measures

The effects of the nursing, the extubation (accidental and unplanned extubation refers to the extubation of an indwelling catheter operated by non-medical personnel), the oral comfort, the incidence of adverse reactions, and nursing satisfaction were evaluated [15].

Efficacy evaluation

Markedly effective: after surgery, the drainage tube was fixed and had no extubation, and the patients had no significant discomfort. Effective: there were 1-2 occurrences of extubation, accompanied by slight oral discomfort or anxiety. Ineffective: the drainage tube was difficult to fix during the nursing, and there were many occurrences of extubation, accompanied by severe discomfort. Effective rate of nursing = (markedly effective + effective cases)/total number of cases * 100%.

Data statistics and processing

In this study, SPSS 15.0 was used to analyze and process the data. The enumeration data (n, %) were analyzed using a chi-squared test. A Kolmogorov-Smirnov test was used for the normality test of the measurement data, and the data conforming to a normal distribution were expressed as the mean ± standard deviation (X ± sd). The comparison of the data between groups was analyzed using an independent t test. When P<0.05, the difference was statistically significant.

Results

Comparison of general information

The disease degree in the experimental and control groups was similar. The sex allocation, age distribution, and average ages were compared between the two groups (Table 1). The results showed that there were no statistically significant differences in these general clinical data between the two groups (all P>0.05), indicating comparability.

Comparison of nursing effects

After surgery, the rehabilitation effects of the different nursing methods were good. The effective rate of nursing in the experimental group was 97.73% (43/44), significantly higher than the 81.40% (35/43) rate in the control group (P<0.05). See Table 2.

Comparison of the extubation rates

Postoperative extubation directly affects the therapeutic and healing effects, so the extubation statuses after the different nursing methods in this study were recorded, observed, and compared between the two groups. The accidental and unplanned extubation rates in the
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Table 2. Comparison of the nursing effects

<table>
<thead>
<tr>
<th>Group</th>
<th>Control group (n=43)</th>
<th>Experimental group (n=44)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Markedly effective</td>
<td>15</td>
<td>18</td>
</tr>
<tr>
<td>Effective</td>
<td>20</td>
<td>25</td>
</tr>
<tr>
<td>Ineffective</td>
<td>8</td>
<td>1</td>
</tr>
<tr>
<td>Effective rate</td>
<td>81.40%</td>
<td>97.73%*</td>
</tr>
</tbody>
</table>

Note: compared with control group, *P<0.05.

Table 3. Comparison of the extubation rates (n, %)

<table>
<thead>
<tr>
<th>Group</th>
<th>Accidental extubation rate</th>
<th>Unplanned extubation rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control group (n=43)</td>
<td>18.60% (8/43)</td>
<td>20.93% (9/43)</td>
</tr>
<tr>
<td>Experimental group (n=44)</td>
<td>2.27% (1/44)*</td>
<td>4.55% (2/44)*</td>
</tr>
<tr>
<td>X²</td>
<td>4.617</td>
<td>5.286</td>
</tr>
<tr>
<td>P</td>
<td>0.032</td>
<td>0.021</td>
</tr>
</tbody>
</table>

Note: compared with control group, *P<0.05.

Table 4. Comparison of oral comfort (n, %)

<table>
<thead>
<tr>
<th>Group</th>
<th>Oral comfort</th>
<th>Discomfort</th>
<th>Nausea</th>
<th>Discomfort + nausea</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control group (n=43)</td>
<td>31 (72.09%)</td>
<td>8 (18.60%)</td>
<td>4 (9.30%)</td>
<td>12 (27.91%)</td>
</tr>
<tr>
<td>Experimental group (n=44)</td>
<td>40 (90.91%)*</td>
<td>3 (6.82%)</td>
<td>1 (2.27%)</td>
<td>4 (9.09%)*</td>
</tr>
<tr>
<td>X²</td>
<td>5.130</td>
<td>2.735</td>
<td>0.343</td>
<td>0.024</td>
</tr>
<tr>
<td>P</td>
<td>0.024</td>
<td>0.098</td>
<td>0.024</td>
<td>0.024</td>
</tr>
</tbody>
</table>

Note: compared with control group, *P<0.05.

Figure 1. Comparison of the adverse reactions. Compared with control group, **P<0.05.

Comparison of adverse reactions

Patients with an indwelling catheter after surgery are usually accompanied by adverse reactions or complications. In this study, the control group had 4 cases of pharyngitis, 4 cases of pulmonary infection, and 6 cases of anxiety, with an incidence of adverse reactions of 32.56% (14/43). The experimental group had 1 case of pharyngitis and 1 case of pulmonary infection, with an incidence of adverse reactions of 4.55% (2/44). There was a statistically significant difference in the incidence between the two groups (P<0.01). See Figure 1.

Comparison of nursing satisfaction

A self-made satisfaction questionnaire was used to score the nursing satisfaction. The results showed that in the control group, 14 patients were satisfied, 15 were basically satisfied, and 14 were dissatisfied. The nursing satisfaction rate in the control group was 67.44%, while that in the experimental group was 86.36% (P<0.05). See Table 5.

Discussion

In recent years, with the development of society and the great improvement in living standards, people’s food types and eating habits have greatly changed, and unhealthy eating habits increasingly cause patients to undergo
gastrintestinal surgery [16]. China has more than 100 million cases of gastrointestinal diseases, of which patients with gastric cancer account for about half of the world’s patients with the disease [17]. Postoperative patients with gastrointestinal diseases often retain their gastric tube for gastrointestinal decompression, to prevent inflammation and reduce the incidence of complications. And an indwelling catheter also promotes gastrointestinal peristalsis and improves the recovery rate [18, 19]. During the indwelling catheter and decompression period after gastrointestinal surgery, patients have different degrees of discomfort. In addition, some patients and their families are unaware of the proper procedures and extubate from the patients without authorization, which leads to various adverse consequences and affects the patients’ postoperative recovery [20, 21].

JACP and others analyzed difficulties in the nursing of incision infections after cardiac surgery through a literature review, briefly describing the influences of gathering insufficient information in literature searching and retrieval on the effects of nursing, and emphasized the importance of data retrieval to EBN [22]. In this study, patients in the experimental group were treated with EBN, and the documents and materials were sufficiently collected to provide data support for follow-up nursing. Liu and others studied the prognosis of different nursing methods after the resection of retroperitoneal neuroblastoma in children. They found that patients treated with EBN had a significantly higher perioperative nursing quality and nursing satisfaction, a significantly lower incidence of postoperative complications, and significantly shorter hospitalization times [23]. Bradyswood conducted research on 458 patients who underwent lumbar fusion surgery and found that EBN could increase the effective rate of nursing and shorten hospitalization time [24]. In this study, nursing satisfaction and the effective rate of nursing in the experimental group were significantly higher than they were in the control group.

According to Bellury et al., postoperative pain management is very necessary, especially because of the continuous and targeted effective communication between medical staff and patients based on evidence. It can relieve the patients’ pain and anxiety and improve their satisfaction [25]. According to Bumb et al., evidence-based communication, which can improve the quality of doctor-patient communication and reduce doctor-patient conflicts and the pain of the patients’ families, is an information exchange and transmission strategy worthy of clinical recommendation [26]. In this study, EBN maintained the doctor-patient relationship, significantly relieved the patients’ anxiety, and improved their emotions. Kwon and others specially reported the risk factors of the unplanned extubation of ICU patients. They emphasized that nursing staff should improve their own judgment ability, identify risk prevention points, and strengthen evidence-based awareness, as well as improve their own nursing levels [27]. In this study, the unplanned and accidental extubation rates were reduced as a result of EBN improving the targeted professional ability of the nursing staff and the enthusiasm of the guidance to their patients.

Therefore, the combination of nursing practice with theories, the deep studies on nursing, and the abandonment of empirical or habitual EBN can provide patients with more scientific, standard, and economic nursing services. They also improve the patients’ understanding of gastrointestinal diseases, indwelling catheters, and the adverse consequences of self-extubation, relieve their resistance, and improve their nursing satisfaction. However, this study also has shortcomings, such as the lack of research experience as well as the shallow analysis and discussion of some problems. These limitations need further improvement in the future.

In summary, EBN can reduce patients’ extubation rates, relieve their negative emotions, and improve their nursing satisfaction during tube nursing after gastrointestinal surgery.

<table>
<thead>
<tr>
<th>Table 5. Comparison of nursing satisfaction (n, %)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group</td>
</tr>
<tr>
<td>Control group (n=43)</td>
</tr>
<tr>
<td>Experimental group (n=44)</td>
</tr>
<tr>
<td>$X^2$</td>
</tr>
<tr>
<td>$P$</td>
</tr>
</tbody>
</table>

Note: compared with control group, *$P<0.05$. 

[13874] 
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Disclosure of conflict of interest

None.

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