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Original Article

Evidence-based nursing can improve the clinical efficacy of cancer pain care for patients with lung cancer

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Abstract: Objective: The goal of this study was to explore the analgesic effects of evidence-based nursing intervention on patients with chronic cancer pain from primary lung cancer and its effects on their daily life. Methods: A retrospective analysis was performed on 125 patients with chronic cancer pain caused by primary lung cancer. Among them, 60 patients using routine nursing were the control group and 65 patients who underwent evidence-based nursing were the experimental group. This analysis compared the following scores in both groups after one month of care: SDS (self-depression score), PI-NRS (pain intensity-numerical rating scale), and QOL-LC (quality of life scale of hepatocellular cancer patients). The adverse event rate and nursing satisfaction was also determined. Results: After one month of nursing care, the SAS and SDS scores for patients in the experimental group were 23.12±5.02 and 24.03±4.97, respectively, which was significantly lower than the scores in the control group, which were 37.65±4.79 and 36.98±5.35, respectively. The difference was statistically significant (P<0.001). The PI-NRS score of the experimental group after one month of nursing was 4.57±0.94, which was significantly lower than that of the control group (6.42±0.79) and also statistically significant (P<0.001).Conclusion: Evidence-based nursing intervention for patients with chronic lung cancer from primary lung cancer can reduce patients' pain, effectively improve their quality of life, alleviate negative emotions, and improve their satisfaction with their nursing care, making it worth promoting in the clinic.

Keywords: Evidence-based nursing, lung cancer, cancer pain, curative effect

Introduction

Lung cancer is a tumor with a high degree of malignancy, recurrence rate, and mortality [1]. Because there are no obvious symptoms in the first stage of lung cancer, many patients have missed the window of opportunity for effective operation at the time of diagnosis [2]. A series of symptoms of lung cancer cause great suffering for patients [3]. Chronic cancer pain is the most common clinical symptom in patients with primary lung cancer, and it is also one of the main causes of pain in patients [4]. Studies [5] have shown that the production of chronic cancer pain is related to the sensitization of afferent and central nerves and the pro-pain substances produced after surgery or radiotherapy. Studies have also [6] found that psychological factors are one cause of chronic cancer pain, in that when the patient's attention on the disease is too focused, psychogenic pain may occur. Other studies [7] have shown that chronic cancer pain has a hugely adverse effect, not only on the patient's physiology and psychology, but also on their quality of life. Therefore, for patients suffering from chronic lung pain with primary lung cancer, in addition to the necessary treatments, how to choose a better-quality care program to alleviate their pain and improve their quality of life of patients has important clinical significance [8].

Evidence-based nursing is a concept of nursing deriving from evidence-based medicine [9]. Evidence-based care asserts that any care program should have a scientific basis. A rational and scientific approach to care should be developed in conjunction with the best nursing research and resources available; the personal professionalism and clinical experience of the

caregiver; and the patient's wishes, values, and circumstances. Nursing staff are also required to strictly abide by the liability system in order to provide patients with complete and high-quality service to improve patient care satisfaction [10, 11]. Since cancer tumor pain has a terrible impact on a patient's therapeutic effects and quality of life, cancer-related pain is an issue that cannot be ignored in cancer care. Although there are many applications of evidence-based medicine in oncology, there are few studies on the application of specific cancers, such as lung cancer pain.

Therefore, here the analgesic and life satisfaction effects of evidence-based nursing intervention on patients with chronic lung cancer are explored in order to determine whether patients suffering from chronic lung cancer and pain can improve their quality of life.

Materials and methods

General information

A retrospective analysis was performed on 125 patients with primary lung cancer-related chronic cancer pain treated in our hospital from January 2014 to April 2016, including 73 males and 52 females, with an average age of 56.3±3.1 years, of which there were 32 patients in stage I, 60 patients in stage II, and 33 patients in stage III. Among them, 60 patients underwent routine nursing as the control group, and 65 patients who underwent evidence-based nursing intervention, in addition to routine nursing, formed the control group. Inclusion criteria: Patients with primary lung cancer with a pathological diagnosis and chronic cancer pain were included. Excluded were patients with severe lung and kidney dysfunction, other tumor-related diseases, and those with communication impairment and non-conformity. Experiments were approved by the Ethics Committee of The Tumor Hospital of Shantou University Medical College. All subjects and their families signed an informed consent and cooperated with medical staff to complete the relevant medical treatment.

Nursing methods

The control group was treated with routine nursing. The pain of the patient was assessed and the patient was guided to use the analgesic as well as receive basic analgesic education for the patient and general knowledge of the disease.

The experimental group used evidence-based nursing in addition to routine nursing. The specific nursing methods were as follows:

(1) Establish a professional evidence-based nursing team: First, a comprehensive assessment of the patient's various situations, from the aspects of physical, psychological, and social values and culture, was performed. Then, relevant literature was reviewed and data on evidence-based nursing, and combined scientific literature, nursing experience, resource allocation, and the real-life situations of patients was used to develop scientific and reasonable nursing measures.

(2) Psychological intervention: Both the generation and relief of pain in patients can be affected by psychology, so it is necessary to provide patients with psychological support and comfort in a timely and enthusiastic manner. The patient was given targeted psychological assistance and guidance according to their individual situation, involving teaching the patient how to defer their attention from the disease itself and related pain and offering knowledge of the disease to help them establish a comprehensive understanding of it. This reduces the patient's psychological burden, and makes it more likely they will actively cooperate with the treatment.

(3) Cognitive intervention: This step involved the distribution of health brochures and offering of health-related classes, so that patients had a more detailed understanding of all aspects of their disease. Patients were instructed to record and evaluate the time, location, and extent of each pain incident to develop a more individualized pain relief plan. Explaining the principles of pain treatment to patients, and advising patients and their families of the necessity, methods, and adverse reactions of painkilling drugs, helps patients to have a more complete understanding in the face of disease and pain and avoid the negative strategies of taking less medicine than needed or not taking painkillers at all to avoid dependence on the drug. Strictly following the WHO three-step analgesic principle to enable patients to use painkillers in a timely and appropriate amount allows pain to be effectively controlled, reducing the level of pain, and ensuring the effectiveness of treatment.

Table 1. General information table

Factor	Test group n=65	Control group n=60	X^2/t	P
Gender			0.000	0.988
Male	38 (58.46)	35 (58.33)		
Female	27 (41.54)	25 (41.67)		
Age (years)			0.091	0.763
≤55	31 (47.69)	27 (45.00)		
>55	34 (52.31)	33 (65.00)		
BMI (kg/m^2)			0.021	0.885
≤22	29 (44.62)	26 (43.33)		
>22	36 (55.38)	34 (56.67)		
History of smoking			0.053	0.818
Yes	36 (55.38)	32 (53.33)		
No	29 (44.62)	28 (46.67)		
Drinking history			0.018	0.892
Yes	43 (66.15)	39 (65.00)		
No	22 (33.85)	21 (35.00)		
Pathological typing			0.064	0.969
Hepatocellular carcinoma	41 (63.08)	38 (63.33)		
Hepatobiliary epithelial carcinoma	13 (20.00)	13 (21.67)		
Mixed lung cancer	11 (16.92)	9 (15.00)		
Pathological staging			0.022	0.989
Phase I	17 (26.15)	15 (25.00)		
Phase II	31 (47.69)	29 (48.33)		
Phase III	17 (26.15)	16 (26.67)		
Disease history (years)	2.91±1.36	2.97±1.28	0.254	0.800

(4) Behavioral intervention: During treatment, deep breathing and music relaxation therapy were performed on the patient to guide relief of nerve and muscle tension. By listening to soothing music, the patient's attention is diverted, thereby relieving pain. In addition, the patient's shoulders, back, and other areas were regularly massaged to promote blood circulation and appease pain.

Observation indicators

After one month of nursing, the SAS (anxiety score) and SDS (depression score) were used to evaluate patients' negative emotions [12]. Lower scores indicated less negative emotions. The patient's pain was assessed using the PI-NRS [13]. A score of 10 indicates severe pain that is unbearable. Pain that is severe but still tolerable rates 7 to 9 points, while 4 to 6 points indicates moderate pain. Mild pain is rated from 1 to 3 points and 0 points indicates no pain. After nursing intervention, the pain score decreased by 4 points or more, indicating a significant improvement. A decrease of 2 to 4 points indicated a moderate improvement, and a decrease of 2 points or less indicated no significant improvement. The QOL-LC scale [14] was used to evaluate five aspects of the patients' life satisfaction: physical, functional, emotional, cognitive and social. Higher scores indicate better quality of life. Incidences of adverse reactions to cancer pain were also recorded and compared between the two groups. Adverse reactions include nausea and vomiting, urinary retention, constipation, and pain coma. Finally, the satisfaction of the two groups of patients was evaluated [15].

Statistical methods

The data was statistically staged using SPSS 18.0 statistical software (Beijing Wangshu Times Technology Co., Ltd.). The measurement data was analyzed by t-test, the count data are expressed as a percentage, and Chi-square test was used. $P<0.05$ indicates that the difference was statistically significant.

Results

Baseline data

There were no significant differences in gender, age, pathological type, or staging between the two groups ($P>0.05$) (**Table 1**).

Evidence-based nursing lowers SAS and SDS scores

The SAS and SDS scores of the experimental group after one month of care were 23.12±

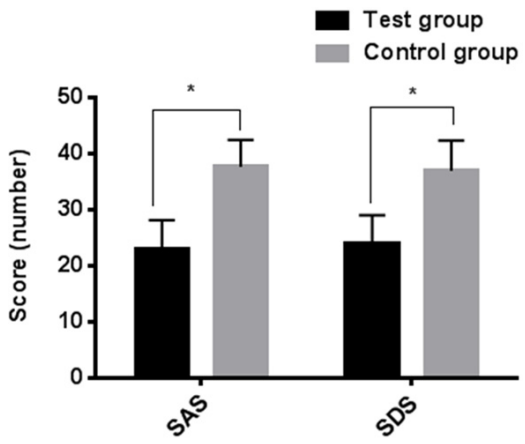

Figure 1. Comparison of SAS and SDS scores between the two groups after one month of nursing. Scores for the experimental group after treatment were significantly lower than those for the control group, and the difference was statistically significant (P<0.05). *indicates P<0.05.

5.02 and 24.03±4.97, respectively, which were significantly lower than the scores of the control group, respectively 37.65±4.79 and 36.98±5.35 points. As shown in **Figure 1** and **Table 2**, the difference was statistically significant (P<0.05).

Evidence-based nursing reduces pain

PI-NRS scores were used to evaluate pain in the two groups of patients before and after treatment. The PI-NRS scores of the experimental group before and after treatment were 7.02±1.14 and 4.57±0.94, respectively. The PI-NRS scores of the control group were 6.89±1.17 and 6.42±0.79, respectively. There was no significant difference in scores between the two groups before treatment, but after one month of nursing, the score of the experimental group was significantly lower than that of the control group (P<0.05) (**Table 3**).

Evidence-based nursing improves quality of life

The function scores of the experimental group in the five areas-functional, physical, emotional, cognitive, and social-were 76.51±2.69, 74.09±2.43, 74.92±2.76, 73.31±3.41, and 74.03±2.65, respectively, which were significantly higher than those in the control group, which were 54.67±2.77, 58.43±2.54, 60.01±3.11, 58.16±2.47, 58.63±2.45, respectively. This difference was statistically significant (P<0.05) (**Table 4**).

Table 2. Comparison of SAS and SDS scores between the two groups after 1 month of care

Time	Test group n=65	Control group n=60	t	P
SAS	23.12±5.02	37.65±4.79		
SDS	24.03±4.97	36.98±5.35		<0.001

Evidence-based nursing reduces adverse reactions

The number of patients with nausea and vomiting, urinary retention, constipation, and pain coma in the experimental group were 4, 2, 3, and 0, respectively. The number of patients with nausea and vomiting, urinary retention, constipation, and pain coma in the control group were 7, 3, 6, and 3, respectively. The incidence of adverse reactions in the experimental group was 13.85%, which was significantly lower than that of the control group (31.67%). The difference was statistically significant (**Table 5**).

Evidence-based nursing improves nursing satisfaction

The number of patients who were satisfied with their nursing staff was 45, while 17 were more satisfied, and 3 reported dissatisfaction. The number of patients in the control group who were satisfied, more satisfied, and dissatisfied with their nursing staff were 27, 14, and 19, respectively. The nursing satisfaction of the experimental group was 95.38%, which was significantly higher than that of the control group (68.33%). The difference was statistically significant (P<0.05) (**Table 6**).

Discussion

As a malignant tumor that is currently incurable, lung cancer continues to rise in morbidity and mortality due to changes in the environment and living habits, posing a serious threat to human health [16]. Chronic cancer pain is a clinical symptom from which many patients with lung cancer suffer. Cancer pain not only causes the patient great physical pain, but also causes the patient to develop anxiety, fear, depression, and other unhealthy psychological concerns. These aspects have serious adverse effects on the patient's quality of life [17]. In the treatment and care of cancer, cancer pain

Table 3. Comparison of PINRS scores between the two groups before and after 1 month of Nursing

Time	Test group n=65	Control group n=60	t	P
Before Nursing	7.02±1.14	6.89±1.17	0.629	0.531
After 1 month of Nursing	4.57±0.94	6.42±0.79	11.86	<0.001

Table 4. Comparison of quality of life between the two groups of patients after 1 month of nursing

Factor	Test group n=65	Control group n=60	t	P
Role function	76.51±2.69	54.67±2.77	44.71	<0.001
Physical function	74.09±2.43	58.43±2.54	35.22	<0.001
Emotional function	74.92±2.76	60.01±3.11	28.39	<0.001
Cognitive function	73.31±3.41	58.16±2.47	28.24	<0.001
Social function	74.03±2.65	58.63±2.45	33.65	<0.001

Table 5. Incidence of adverse reactions to cancer pain in the two groups of patients during the month of nursing

Adverse reactions	Test group n=65	Control group n=60	X^2	P
Feel sick and vomit	4 (6.15)	7 (11.67)	-	-
Urinary retention	2 (3.08)	3 (5.00)	-	-
Constipation	3 (4.62)	6 (10.00)	-	-
Painful coma	0	3 (5.00)	-	-
Incidence rate	9 (13.85)	19 (31.67)	5.700	<0.050

Table 6. Comparison of nursing satisfaction between the two groups of patients after 1 month of nursing

Satisfactory situation	Test group n=65	Control group n=60	X^2	P
Satisfaction	45 (69.23)	27 (45.00)	-	-
More satisfied	17 (26.15)	14 (23.33)	-	-
Not satisfied	3 (4.62)	19 (31.67)	-	-
Nursing satisfaction rate	62 (95.38)	41 (68.33)	15.74	<0.001

is an important indicator for evaluating therapeutic and nursing effects [18]. At present, the treatment of pain in cancer patients is mainly carried out by nursing staff [19]. Therefore, developing and implementing a scientific and effective nursing program has crucial significance for relieving pain and improving the quality of life in the clinical setting [20]. Evidence-based care is also known as "empirical nursing". This type of care combines a patient's individual situation with the most appropriate research and methods. Ideally, research is used to solve nursing problems as they arise so that patient's care measures are kept up-to-date and efficient [21]. However, for patients with chronic cancer pain from primary lung cancer, evidence-based nursing has yet to be widely applied and there is no systematic study on its application effect. This study sought to close that gap in knowledge by investigating the effects of evidence-based nursing on patients with chronic lung cancer from primary lung cancer.

When evidence-based care was applied to patients in the experimental group for one month, we first compared the negative emotions of the two groups, namely SAS and SDS scores. The SAS and SDS scores of the experimental group were significantly lower than the scores of the control group, indicating that evidence-based nursing can effectively improve negative emotions of patients with lung cancer pain. Some studies [22] have shown that for patients with lung cancer, pain and the adverse reactions of anti-tumor drugs causes discomfort, which may easily translate into a psychological burden for patients. Negative emotions such as anxiety and depression further aggravate the patient's condition. Therefore, it can be considered that evidence-based nursing can delay the worsening of a patient's condition by eliminating negative emotions of patients.

Comparison of the PI-NRS scores measuring quality of life after one month of care in both groups showed that the PI-NRS score of the experimental group was significantly lower than that of the control group. The quality of life scores of the experimental group were significantly higher than those of the control group. The above results show that evidence-based care can not only effectively relieve pain in patients, but also improve their quality of life. Some studies [23] have shown that by understanding the role of drugs and the various risks and specific conditions of the disease, patients can reduce their concerns about drug depen-

dence, so that the drug can be used correctly to ensure therapeutic efficacy. There is evidence [24] that with accurate pain assessment and the correct use of painkillers, cancer pain can be effectively alleviated in most patients. Finally, comparison of the incidence of adverse reactions during the one-month care period revealed satisfaction with the nursing care for the two groups of patients. The results showed the incidence of adverse reactions in the experimental group was significantly lower than that of the control group ($P<0.05$). Nursing satisfaction for the experimental group was 95.38%, which was significantly higher than that of the control group (68.33%). The difference was statistically significant ($P<0.05$). This shows that the use of evidence-based care can not only relieve cancer pain, but also reduce the adverse reactions of cancer treatment and improve the patient's satisfaction with their nursing care.

A study of evidence-based care in the application of prostate cancer [25] showed that such care can effectively reduce patients' adverse reactions and improve nursing satisfaction. Although there is no detailed description of cancer pain in this study, from the side view it is consistent with our conclusions.

In summary, for patients with primary lung cancer, the occurrence of cancer pain reduces patients' daily satisfaction, and may cause them to lose confidence in life. Only effective control of cancer pain can improve the quality of life for patients. The application of evidence-based nursing has been shown to ease negative emotions in patients, thus alleviating their cancer pain and improving their overall quality of life. For these reasons, this study has significant value for clinical application.

Disclosure of conflict of interest

None.

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