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Original Article

Effect of integrated medical and nursing intervention model on quality of life and unhealthy emotion of patients with esophageal cancer undergoing radiotherapy

Zhengyun Wang, Yuqiao Cheng, Jijuan Li, Xuyun Hu

Department of Oncology Surgery, Lu'an Hospital Affiliated to Anhui Medical University, Lu'an, Anhui Province, China

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Abstract: Objective: To explore the application of integrated medical and nursing intervention model in radiotherapy for patients with esophageal cancer. Methods: A total of 78 patients with esophageal cancer undergoing radiotherapy were randomly divided into two groups: control group (n=39, receiving traditional separate medical and nursing management) and study group (n=39, receiving integrated medical and nursing intervention mode). Before and after intervention, the mental state, nutritional index, quality of life and self-efficacy were compared between the two groups, and the adverse reactions were recorded during radiotherapy. Results: Compared with those before intervention, the scores of hamilton anxiety rating scale (HAMA) and hamilton depression scale (HAMD) were lower in both groups when they were discharged from hospital, and the study group was lower than the control group (all $P<0.05$). The scores of comprehensive quality of life assessment questionnaire (GQOLI-74) and self-management efficacy scale (SUPPH) were increased in both groups, and the study group was higher than the control group (all $P<0.05$). After intervention for 3 weeks, the levels of Hb, TP and Alb in the two groups were higher than those before intervention, and the study group was higher than the control group (all $P<0.05$). During radiotherapy, the total incidence of adverse reactions in the study group was lower than that in the control group ($P<0.05$). Conclusion: Integrated medical and nursing intervention can obviously relieve the unhealthy emotion and improve the nutritional status, quality of life and self-efficacy for patients with esophageal cancer undergoing radiotherapy.

Keywords: Integrated medical and nursing intervention model, esophageal cancer, radiotherapy, mental state, nutritional status, quality of life

Introduction

For some patients with advanced esophageal cancer, surgical treatment may not be a good option, instead, radiotherapy becomes the major treatment [1, 2]. As the toxic and side effects of radiotherapy are obvious and last for a long time, most patients will suffer adverse psychological emotions during this period, and even anxiety and depression in severe cases [3]. Long-term anxiety or depression not only affects patients' physical and mental health, but also affects the therapeutic effect of radiotherapy [4]. Therefore, it is necessary to implement reasonable and effective nursing interventions to relieve their unhealthy emotions and to improve the quality of life.

Traditional nursing mode is mostly traditional separate medical and nursing management model. In this nursing mode, the lack of effective communication between doctors and nurses interrupts the continuity of nursing work, which is not conducive to the nursing staff to record the patient's disease progress accurately and timely, and it is easy to delay treatment. In addition, the limited communication between doctors and nurses and between doctors and patients also tends to reduce patients' trust in medical care, which is not conducive to subsequent treatment [5].

In contrast, the integrated medical and nursing intervention mode is a new nursing management mode. It is a new nursing intervention

mode in which clinicians and nurses work together to formulate treatment plans and a complete set of nursing measures, so as to reduce the risk of adverse reactions and to improve patients' unhealthy psychology, but this nursing mode is rarely used during radiotherapy for esophageal cancer [6]. Therefore, this study aimed to provide reference for the clinical selection of nursing mode in the process of radiotherapy for esophageal cancer by comparing the effects of the integrated medical and nursing intervention mode and the traditional separate medical and nursing management mode on the psychological mood, nutritional status and other indexes of patients with esophageal cancer undergoing radiotherapy.

Materials and methods

Baseline data

In this prospective study, 78 cases with esophageal cancer undergoing radiotherapy who received treatment in our hospital from January 2016 to January 2020 were divided into control group and study group according to the random number table method, with 39 cases in each group. Inclusion criteria: Patients were diagnosed with esophageal cancer, aged 40 to 75; Patients were treated with radiotherapy; The electrocardiogram, liver and kidney function, heart and lung tests were all normal; The length of hospital stay was >3 weeks; The estimated survival was >3 months; Patients signed the informed consent. Exclusion criteria were as follows: Patients who received neo-adjuvant therapy; Comorbid with distant metastasis; Comorbid with other malignant tumors; Patients with blood system diseases; Past history of mental illness and epilepsy; Patients who participated in other research projects, etc. This research has been approved by the Medical Ethics Committee of our hospital.

Methods

In the control group, the patients were treated with traditional separate medical and nursing management mode [7]. Doctors were in charge of the formulation of radiotherapy plan. Nurses prescribed medication for the patients as prescribed by the doctors, carried out routine inpatient care and timely informed the competent doctors if there were complications.

In the study group, the patients were treated with integrated medical and nursing intervention model [8, 9]. (1) A "integrated medical and nursing" group was set up. The group was composed of clinicians and full-time nursing staff, and they were responsible for the implementation and nursing of all the diagnosis and treatment plans for patients after admission. (2) Health education: After admission, the medical staff informed the patient about the diagnosis and treatment basis and detailed treatment plan, and communicated with the patient more often to understand the patient's other conditions in addition to the disease, such as psychological state, daily eating habits and so on, so as to give targeted care. (3) Psychological nursing: Medical staff needed to communicate with patients frequently, timely find their emotional fluctuations, and invite professional psychological counselors to carry out targeted psychological counseling to enhance patient's confidence; Medical staff also needed to listen patiently to the patients' self-statements and resonate with them, so as to vent their unhealthy emotions. Medical staff also needed to appease the unstable emotions of the patients with a gentle attitude through face-to-face communication and eliminate their anxiety symptoms. (4) Dietary guidance: In order to ensure the balanced nutrition intake of patients, the full-time nutritionists could be invited to make dietary plans for them. (5) Discharge guidance and out-of-hospital nursing: Before discharge, medical staff needed to explain in detail the matters needing attention after discharge and the methods of taking drugs, etc., and inform patients that they should immediately return to the hospital for relevant examinations if they have any physical symptoms different from those in the past; They could establish WeChat communication groups, so as to communicate with patients or their families and guide patients to recover outside the hospital.

Outcome measures

Main outcome measures

(1) Hamilton Anxiety Rating Scale (HAMA) and Hamilton Depression Scale (17 items) (HAMD) were used to evaluate the psychological state of patients before intervention and at discharge [10, 11]. The higher the scores of HAMA and

Table 1. Baseline data in the two groups ($\bar{x}$ ± sd)

Index	Study group (n=39)	Control group (n=39)	χ^2/t	P
Gender (n)			0.205	0.651
Male	21	19		
Female	18	20		
Age (years)	59.6±7.4	60.4±8.1	0.455	0.650
BMI (kg/m^2)	23.38±2.30	22.77±3.22	0.963	0.339
Course of disease (years)	4.92±1.01	4.77±1.39	0.545	0.587
Tumor site (n)			2.225	0.329
Upper part	16	12		
Middle part	14	12		
Lower part	9	15		
TNM stage (n)			1.032	0.597
Stage II	10	11		
Stage III	16	19		
Stage IV	13	9		
Pathological type (n)			1.277	0.528
Squamous cell carcinoma	32	35		
Adenocarcinoma	4	3		
Adenosquamous carcinoma	3	1		
Education level (n)			0.555	0.456
Junior high school and below	29	26		
High school and above	10	13		

Note: BMI: body mass index.

HAMD, the more serious the degree of anxiety and depression. (2) The levels of hemoglobin (Hb), serum total protein (TP) and albumin (Alb) were measured by automatic hematology analyzer before and after intervention for 3 weeks. (3) The quality of life was evaluated by the comprehensive quality of life assessment questionnaire (GQOLI-74) before intervention and at discharge, with a total score of 76-380 [12]. The higher the score, the better the quality of life.

Secondary outcome measures

(1) Self-management efficacy scale (SUPPH) was used to evaluate patients' self-efficacy before intervention and at discharge, including three dimensions: relieving stress (10-50 points), positive attitude (15-75 points) and self-decision (3-15 points) [13]. The higher the score, the stronger the self-efficacy. (2) The adverse reactions were compared between the two groups during radiotherapy, such as nausea and vomiting, skin reaction, radiation esophagitis, radiation pneumonitis and oral mucosa reaction.

Statistical analysis

SPSS 20.0 was used for data statistics, and the counting data were expressed as (n/%), and χ^2 test was used. The measurement data were expressed by ($\bar{x}$ ± sd). Paired t test was used for comparison before and after intervention between the same group. Independent t test was used for comparison between the two groups. The difference was statistically significant with P<0.05.

Results

Baseline data

There was no significant difference in general data between the two groups (all P>0.05), but it was comparable between the two groups (**Table 1**).

Psychological state

Compared with those before intervention, the scores of HAMA and HAMD in the two groups were lower when they were discharged from

Table 2. Scores of HAMA and HAMD in the two groups before and after intervention ($\bar{x}$ ± sd, score)

Group	Time	HAMA score	HAMD score
Study group (n=39)	Before intervention	7.04±1.11	7.33±1.20
	On discharge	5.10±1.06*,#	5.32±1.01*,#
Control group (n=39)	Before intervention	7.19±1.42	7.23±1.18
	On discharge	6.05±1.07*	6.20±1.04*

Note: Compared with the same group before intervention, *P<0.05; Compared with the control group on discharge, #P<0.05. HAMA: hamilton anxiety scale; HAMD: hamilton depression scale (17 items).

Table 3. Nutritional index levels in the two groups before and after intervention ($\bar{x}$ ± sd, g/L)

Group	Time	Hb	TP	Alb
Study group (n=39)	Before intervention	104.68±8.10	65.50±5.48	40.05±4.33
	After 3 weeks of intervention	112.02±6.59*,#	69.95±5.82*,#	46.97±5.50*,#
Control group (n=39)	Before intervention	104.27±8.27	65.08±5.30	40.64±5.85
	After 3 weeks of intervention	108.20±7.44*	67.20±5.84*	43.33±4.97*

Note: Compared with the same group before intervention, *P<0.05; Compared with the control group after intervention for 3 weeks, #P<0.05. Hb: hemoglobin; TP: total protein; Alb: albumin.

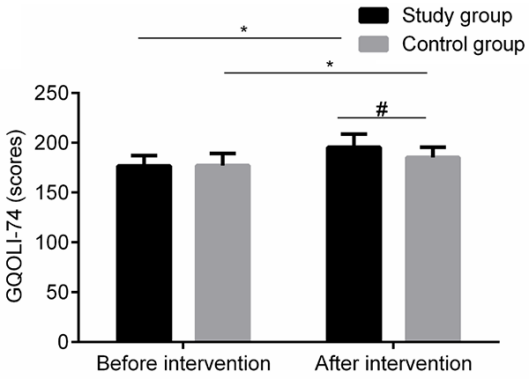

Figure 1. The GQOLI-74 scores of the two groups were before intervention and on discharge. Compared with the same group before intervention, *P<0.05; compared with the control group on discharge, #P<0.05. GQOLI-74: comprehensive quality of life assessment questionnaire.

hospital, and the study group was lower than the control group (all P<0.05; **Table 2**).

Nutritive indexes

After intervention for 3 weeks, the levels of Hb, TP and Alb in the two groups were higher than those before intervention, and the study group was higher than the control group (all P<0.05; **Table 3**).

Quality of life

Compared with those before intervention, the GQOLI-74 scores of patients in both groups increased significantly when they were discharged from hospital, and the study group was higher than the control group (all P<0.05; **Figure 1**).

Self-efficacy

Compared with those before intervention, the SUPPH scores of patients in both groups increased significantly when they were discharged from hospital, and the study group was higher than the control group (all P<0.05; **Table 4**).

Adverse reactions

During radiotherapy, the total incidence of adverse reactions in the study group was significantly lower than that in the control group (P<0.05; **Table 5**).

Discussion

Radiotherapy for esophageal cancer is usually a long process, in which the unhealthy psychology of patients can affect the follow-up treatment effect. Therefore, the scientific nursing intervention measures should be given to improve their unhealthy psychology. Integrated medical and nursing intervention mode is a new nursing management mode, in which clinicians and nursing staff work together to formulate treatment plans and a complete set of nursing measures. This nursing mode mainly

Table 4. Scores of Supph before and after intervention in the two groups ($\bar{x} \pm sd$, score)

Group	Time	Relieve stress	Positive attitude	Self decision making
Study group (n=39)	Before intervention	22.20±4.40	40.04±5.55	6.50±1.11
	On discharge	29.94±5.20*,#	52.20±6.39*,#	11.01±2.26*,#
Control group (n=39)	Before intervention	22.74±4.93	40.75±6.29	6.24±1.74
	On discharge	25.58±5.44*	46.69±5.38*	8.30±1.80*

Note: Compared with the same group before intervention, *P<0.05; Compared with the control group on discharge, #P<0.05. SUPPH: strategies used by people to promote health.

Table 5. Adverse reactions of patients in the two groups during radiotherapy (n, %)

group	Nausea and vomiting	Skin reaction	Radiation esophagitis	Radiation pneumonitis	Oral mucosal reaction	Total incidence
Study group (n=39)	2 (5.13)	1 (2.56)	1 (2.56)	0 (0.00)	1 (2.56)	5 (12.82)
Control group (n=39)	4 (10.26)	3 (7.69)	2 (5.13)	2 (5.13)	3 (7.69)	14 (35.90)
χ^2						5.636
P						0.018

reflects the nursing advantage of integrating medical care with patients, which is conducive to promoting effective communication among the three, and they can timely and effectively deal with any abnormal conditions of patients, thus effectively reducing complications and promoting the prognosis of patients [14].

The results of this study showed that HAMA and HAMD scores of patients in both groups at discharge were lower than those before the intervention, and the study group was lower than the control group. On discharge, the GQOLI-74 scores of patients in both groups were higher than those before the intervention, and the study group was higher than the control group, which suggested that the integrated medical and nursing intervention model could significantly improve the adverse psychological mood of patients with esophageal cancer during radiotherapy, and it was more conducive to improving their quality of life. Presumably, the model of integrated medical and nursing intervention model is patient-centered, and a special "integrated medical and nursing" group composed of clinicians and full-time nursing staff is responsible for the implementation and nursing of all the diagnosis and treatment plans for patients after admission to hospital. This nursing model is designed to take the needs of patients as the starting point, pay attention to their psychological changes and give appropriate psychological intervention, so it can effectively alleviate their unhealthy emotions, mobilize the enthusiasm for treatment, improve the degree of cooperation, and thus contribute to the improvement of their quality of life [15]. Studies by Van der Biezen et al. have also pointed out that the implementation of integrated medical and nursing intervention model can improve the unhealthy psychology of patients with malignant tumor [16].

In terms of nutritional indicators, the levels of Hb, TP and Alb in the study group were higher than those in the control group after intervention for three weeks, while the total incidence of adverse reactions was lower than that in the control group in this research, suggesting that the integrated medical and nursing intervention model could significantly improve the nutritional status of patients receiving radiotherapy for esophageal cancer, reduce adverse reactions, and thus contribute to improve their prognosis. This may be related to the following advantages of the integrated medical and nursing intervention model: (1) A full-time "integrated medical and nursing" team is set up to participate in the diagnosis, treatment and nursing work of patients roundly, so as to have a more comprehensive understanding of patients' diseases, body and mind and nutritional status [17]. (2) The "integrated medical and nursing intervention mode" team is composed of clinicians and full-time nurses. However, clinicians and full-time nursing staff pay more attention to patients' diseases and psychological problems, but they are not more experienced than

full-time nutritionists in nutrition. Therefore, professional nutrition doctors are invited to make diet plans for patients, which not only makes up for the limitations of nutritional nursing work of professional nurses, but also solves the lack of first-line nursing experience of professional nutrition doctors for patients. Under the multidisciplinary cooperation mode, it is more conducive to the improvement of patients' nutritional status [18]. Studies by Mei et al. have pointed out that the integrated medical and nursing intervention model aims to pay more attention to the recovery of patients' psychology, nutrition and other non-diseases besides the diseases themselves, and it is more reasonable to match their nutritional needs [19].

Compared with those before intervention, the SUPPH scores of patients in both groups increased significantly when they were discharged from hospital, and the study group was higher than the control group, suggesting that the integrated medical and nursing intervention model could significantly improve the self-efficacy of patients with esophageal cancer undergoing radiotherapy. This is because patients are provided with a whole process of intervention integrating medical treatment and nursing through the integrated medical and nursing intervention mode. Both doctors and nurses work together to optimize the management process and improve the nursing effect [20]. Health education can effectively improve patients' cooperation degree and psychological counseling can enhance patients' self-confidence, thus contributing to the improvement of their self-efficacy [21]. Edwards et al. have also pointed out that the integrated medical and nursing intervention model is helpful to improve the self-efficacy of patients with malignant tumor [22].

However, this research is a single-center study with limited sample size, so further studies are still needed to reveal the effect of integrated medical and nursing intervention mode on long-term quality of life of patients with esophageal cancer undergoing radiotherapy.

To sum up, integrated medical and nursing intervention can obviously relieve the unhealthy emotion and improve the nutritional status, quality of life and self-efficacy for patients with esophageal cancer undergoing radiotherapy. Furthermore, it can also reduce the incidence of adverse reactions, which is worthy of clinical application.

Disclosure of conflict of interest

None.

Address correspondence to: Xuyun Hu, Department of Oncology Surgery, Lu'an Hospital Affiliated to Anhui Medical University, No.21 Wanxi West Road, Lu'an 237000, Anhui Province, China. Tel: +86-0564-5332128; E-mail: huxuyunu8i4@163.com

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