

## Original Article

# Effect of multidisciplinary collaborative continuous nursing on the psychological state and quality of life of patients with cervical cancer

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**Abstract:** Objective: To explore the effect of multidisciplinary collaborative continuous nursing on the psychological state and quality of life of cervical cancer patients. Methods: A total of 132 patients with cervical cancer who were hospitalized in our hospital were selected as the research subjects, and they were randomized into the observation group (n=66) and the control group (n=66). The control group was given regular continuous nursing, while the observation group was given three-month multidisciplinary collaborative continuous nursing. It was conducted through WeChat, telephone follow-up, face-to-face consultation and lectures, giving guidance on diet, medication, pain control, psychological health, self-care, review time, recognition and processing of postoperative complications, daily activities, social behaviors and so on. Patients' anxiety, depression, quality of life, cancer-related fatigue, complication incidence, and sleep quality were compared between the two groups. Results: Self-rating Anxiety Scale (SAS) and Self-Rating Depression Scale (SDS) were applied for evaluation. The anxiety and depression scores of patients in the observation group were significantly lower than those in the control group (both  $P < 0.001$ ). The scores on physical functioning, general health, social role functioning, emotional role functioning, and mental health, in the observation group were higher than those in the control group (all  $P < 0.01$ ). Compared with patients in the control group, those in the observation group had higher scores on behavioral/severity, affective meaning, sensory and cognition/mood (all  $P < 0.001$ ). Patients in the observation group had lower complication incidence of postoperative nausea, abdominal pain, wound infection and intestinal obstruction ( $P < 0.05$ ). Besides, the sleep quality scores of patients in the observation group were also lower than those in the control group (all  $P < 0.001$ ). Conclusion: The application of multidisciplinary collaborative continuous nursing for patients with cervical cancer is effective. It can improve patients' depression, anxiety, quality of life, cancer-related fatigue, sleep quality, and reduce the incidence of complications. Therefore, it is worthy of clinical application and promotion.

**Keywords:** Cervical cancer, multidisciplinary collaboration, continuous nursing, quality of life, psychological state

## Introduction

Cervical cancer is a common gynecological malignant tumor in the female reproductive tract which originates from the cervix [1, 2]. The cause is complicated, and it is closely related to factors such as HPV virus infection, sexual behaviors, times of childbirths, infections of pathogens such as Chlamydia trachomatis and trichomoniasis, smoking, malnutrition, and bad sanitation [3]. Some research has revealed that there are about 500,000 cases of cervical

cancer, each year around the world, and more than 260,000 women die of cervical cancer annually, mainly in developing countries. It ranks second among female malignancies and those affected tend to be younger females [4]. The onset of the disease is insidious, and in most cases, it doesn't cause any noticeable symptoms in the early stages. As the disease progresses, its manifestation can be noticed as contact bleeding and abnormal bleeding and discharge from the vagina. When the disease develops to an advanced stage, the prognosis

## Multidisciplinary collaborative continuous nursing on cervical cancer patients

is bad, which can threaten life [5]. At present, the main treatment for cervical cancer include surgery, radiation therapy, chemotherapy, and drug therapy [6]. However, there many complications after surgery such as postoperative bleeding, vaginal stump dehiscence, vaginal stump bleeding, vesicovaginal fistula, rectovaginal fistula, urinary fistula, pulmonary infection, stress-induced gastric ulcer, lower extremities deep vein thrombosis are extremely likely to occur. What's worse, the severe physical and mental trauma caused by the decline of the physical functioning brought on by the disease makes patients highly vulnerable to negative emotions such as anxiety, fear and sense of loss. It enormously affects their recovery, psychological health and quality of life [7]. Therefore, alleviating depression and anxiety and improving the quality of life and mental health of patients has become the focus of postoperative nursing.

Continuous nursing can meet patients' needs on health care and psychological support after discharge and promote recovery, since it provides systemic services such as medical treatment, nursing, rehabilitation promotion, and health guidance for patients after discharge [8, 9]. Multidisciplinary collaborative continuous nursing is the application of multidisciplinary collaboration concept to continuous nursing, complementing each other for the limitations of the professional skills of nursing staff. It aims to provide patients with a comprehensive and high-quality nursing service [10]. Although there are some reports on the application of multidisciplinary collaborative continuous nursing for patients with cervical cancer, they have not focused on the patients' psychological state, sleep quality and cancer-related fatigue [11]. This study mainly explores the application effect of multidisciplinary collaborative continuous nursing on improving the psychological state and quality of life of patients after cervical cancer surgery.

### Materials and methods

#### *Generation information*

A total of 132 patients with cervical cancer hospitalized and operated on in our hospital from May 12, 2019 to June 30, 2020 were selected as the research subjects, and they were randomized into the observation group (n=66) and

control group (n=66). This study was approved by the Medical Ethics Committee of our hospital.

Inclusion criteria were as follows: patients who met the diagnostic criteria for cervical cancer [12]. Patients aged >18 years old; Patients who needed surgery; Patients who agreed to participate in this study and signed an informed consent.

Exclusion criteria were as follows: patients with cancer metastasis; patients with dysfunction of important organs or systemic infectious diseases; patients with a history of mental illness or cognitive impairment; patients with metastatic cervical cancer that can only be treated with palliative treatment and cannot tolerate operation; patients with other malignant tumors.

#### *Methods*

During hospitalization, the two groups of patients received the same nursing, including postoperative complication prevention, diet guidance, and condition monitoring. However, after being discharged from the hospital, the two groups of patients were treated with different continuous nursing.

Patients in the control group were given regular discharge guidance and continuous nursing including telephone follow-up once every week to acquire the existing problems and providing guidance.

Patients in the observation group received a multidisciplinary collaborative continuous nursing in addition to the nursing measures taken in the control group. The specific measures include: (1) Establishing a multidisciplinary collaborative continuous nursing team consisting of 10 medical staff, including 3 doctors (1 chief physician, 2 attending physicians), 1 dietitian, 1 pharmacist, 1 psychological counselor, 1 sex counselor, 1 head nurse and 2 nurses in charge. (2) Collecting basic data of patients and making continuous nursing files. (3) Responsibility of team members: doctors were responsible for answering questions about patients' postoperative wounds, such as redness and swelling, and other surgical and disease-related problems; pharmacists were responsible for formulating medication plans for patients; psychological counselors were

## Multidisciplinary collaborative continuous nursing on cervical cancer patients

responsible for patients' psychological problems; dietitians were responsible for formulating dietary prescriptions; the head nurse was responsible for coordinating and arranging the work of the team members to ensure the progress and its quality; the nurse in charge was responsible for guiding patients and their families in home self-care, health education, and making of follow-up files. (4) Formulating a multidisciplinary collaborative continuous nursing plan and implementing nursing work in accordance with the plan (the content of the telephone follow-up was determined three days after the team was formed; messages needing to be sent in the WeChat group were discussed one day in advance; the main content of the family visit was determined 5 days before the family visit; a special lecture was arranged 10 days after the establishment of the team). (5) Establishing a WeChat group of multidisciplinary collaborative continuous nursing. Group members share knowledge about cervical cancer-related rehabilitation, diet, and self-care in the group every day, and give professional advice to patient consultations. (6) Telephone follow-up. According to the plan, a telephone follow-up and record was done every 5 days, with follow-up questions about postoperative recovery, mental state, review time, medication, etc. (7) Family visit. A professional team was established including 5 members, a doctor, a nurse, a psychological counselor, a dietitian and a pharmacist. Family visit was implemented once every 2 weeks. They would communicate with patients face to face according to WeChat conversations, telephone follow-up and personal situations. The family visit conversations focused on dietary guidance, medication guidance, pain control, mental health, self-care knowledge, review time, discernment and treatment of postoperative complications, daily behaviors, social behavior etc. (8) Special lectures. Special lectures on health education were held in the hospital every month. (9) Nursing effect evaluation. Nursing intervention was evaluated every 2 weeks and the nursing plan was adjusted if necessary.

### *Outcome measures*

*Main outcome measures:* (1) The anxiety status of patients in the two groups was compared three months after discharge. Self-rating Anxiety Scale (SAS) was used to assess the

anxiety of patients [13]. SAS score  $\geq 50$  points indicated existence of anxiety symptoms, and the scores were positively correlated with the anxiety degree. (2) The depression status of patients in the two groups was compared three months after discharge. Self-rating Depression Scale (SDS) was applied to evaluate the depression status of patients (scores from 53 to 62 points indicating mild depression; 63 to 72 representing moderate depression; scores over 73 points falling on severe depression). The scores were positively correlated with the degree of depression [14]. (3) The quality of life of patients in the two groups was compared three months after discharge. MOS SF-36 was used to measure the quality of life of the patients. It included 5 sections: physical functioning, general health, social role functioning, emotional role functioning, and mental health. The full score of all sections is 100 points. A higher score represented better quality of life in each relevant section [15].

*Secondary outcome measures:* (1) Cancer-related fatigue of patients in the two groups was compared. Piper Fatigue Scale (PFS) was used to measure the four dimensions of patients' cancer-related fatigue, which included behavioral/severity, affective meaning, sensory and cognition/mood. Scores were positively correlated with the degree of cancer-related fatigue [16]. (2) Incidence of complication of patients between two groups was compared one month after discharge, with complications including nausea, abdominal pain, wound infection, intestinal obstruction and others. If multiple complications occurred in the same patient, they were all counted in total cases of complications. Total incidence equals number of complication cases/total number of cases  $\times 100\%$ . (3) Sleep quality of patients between two groups was compared by the Pittsburgh Sleep Quality Index (PSQI). Higher scores represented worse sleep quality [17, 18].

### *Statistical analysis*

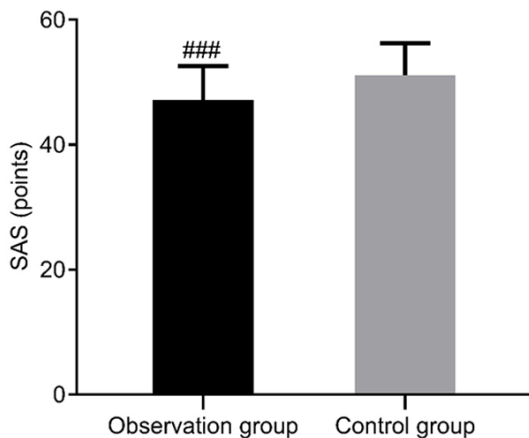
SPSS 20.0 was chosen for statistical analysis. Count data was expressed as  $n/\%$ , and performed by  $\chi^2$  test; Measurement data conforming to a normal distribution were expressed as mean  $\pm$  standard deviation ( $\bar{x} \pm sd$ ). Independent t test was applied to comparison between groups. Data which did not conform to a normal distribution was expressed as the

# Multidisciplinary collaborative continuous nursing on cervical cancer patients

**Table 1.** Comparison of general information of patients between the two groups (n,  $\bar{x} \pm sd$ )

Indexes	Observation group (n=66)	Control group (n=66)	$\chi^2/t$	P
Age (years)	44.4±8.2	45.5±7.9	0.808	0.420
Pathological type			0.214	0.898
Squamous cell carcinomas	55	53		
Adenocarcinoma	7	8		
Squamous adenocarcinoma	4	5		
FIGO 2009 stages			0.461	0.927
Ia	13	12		
Ib	6	7		
IIa	46	45		
IIb	1	2		
Comorbidities				
Hypertension	8	10	0.257	0.612
Uterine fibroids	7	6	0.085	0.770
Surgical methods			0.527	0.912
Lower cervical coning and cervical annulus	11	12		
Hysterectomy	12	13		
Hysterectomy and adnexectomy	1	2		
Extensive hysterectomy	42	39		

Note: FIGO: International Federation of Gynecology and Obstetrics.



**Figure 1.** Comparison of SAS scores of patients between two groups. Compared with the control group, ###P<0.001. SAS: Self-rating Anxiety Scale.

median. Rank sum test was implemented for comparison between groups. The difference was statistically significant at P<0.05.

## Results

### Comparison of general information of patients between the two groups

During the time of this study, there were no patients lost to follow-up or who dropped out in either group.

There was no statistically significant difference between patients of the two groups in age, pathological type, FIGO 2009 stage, comorbidities, and surgical methods (P>0.05). Therefore the two groups were comparable. See **Table 1** in detail.

### Comparison of anxiety of patients between the two groups

SAS score of the observation group was lower than that of the control group (47.16±5.41 vs. 51.15±5.12; t=4.352, P<0.001). See **Figure 1**.

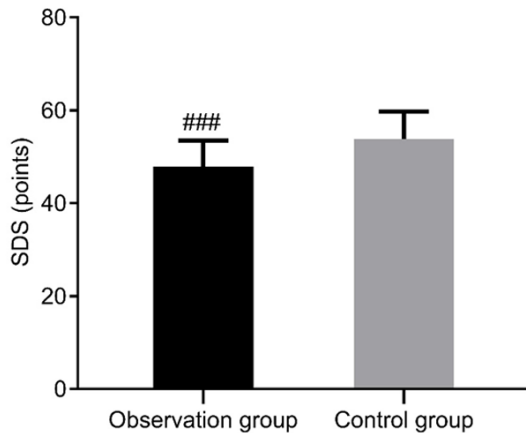
### Comparison of depression in patients between the two groups

SDS score of the observation group was lower than that of the control group (47.89±5.60 vs. 53.87±5.87; t=5.988, P<0.001). See **Figure 2**.

### Comparison of the quality of life between patients in the two groups

Compared with patients in the control group, the scores of physical functioning, general health, social role functioning, emotional role functioning and mental health of those in the observation group were higher (all P<0.01). See **Table 2**.

## Multidisciplinary collaborative continuous nursing on cervical cancer patients



**Figure 2.** Comparison of SDS scores of patients between two groups. Compared with the control group, ### $P < 0.001$ . SDS: Self-rating Depression Scale.

### *Comparison of cancer-related fatigue of patients between the two groups*

Compared with patients in the control group, those in the observation group had lower scores on behavioral/severity, affective meaning, sensory and cognition/mood (all  $P < 0.001$ ). See **Table 3**.

### *Comparison of postoperative adverse reactions of patients between the two groups*

In the observation group, there were 3 cases of nausea and 2 cases of abdominal pain. The total incidence of complications was 7.58%. In the control group, there were 7 cases of nausea, 3 cases of abdominal pain, 3 cases of wound infection, and 1 case of intestinal obstruction. The total incidence of complications was 21.21%. The total incidence of complications in the observation group was significantly lower than that in the control group ( $P < 0.05$ ). See **Table 4**.

### *Comparison of sleep quality of patients between the two groups*

Compared with patients in the control group, patients in the observation group had lower score on PSQI ( $10.95 \pm 2.11$  vs.  $14.70 \pm 3.41$ ;  $t = 7.597$ ,  $P < 0.001$ ). See **Figure 3**.

## **Discussion**

Since 2007, scholars in China have applied continuous nursing to out-of-hospital care for

patients with chronic and surgical diseases, which has achieved good results. It can reduce the recurrence rate and improve the prognosis of patients as well as the quality of care [19, 20]. Multidisciplinary collaborative continuous nursing refers to a series of standardized, individualized, and comprehensive continuous nursing services formulated from a multidisciplinary perspective to improve the prognosis of patients. The concept of multidisciplinary collaboration, combined with continuous nursing has been widely applied to clinical nursing and has achieved positive effects [21, 22].

Anxiety and depression are the most common psychological states of patients with cervical cancer after surgery. The inability to deal with negative emotions may affect the patient's rehabilitation. Zhao et al. took 80 patients undergoing radical mastectomy as research subjects [23]. In their study, patients in the control group received regular postoperative intervention, while those in the observation group underwent a multidisciplinary collaborative model to continuous nursing. It found that the SAS score and SDS score of patients in the observation group were significantly lower than those in the control group. In this study, the observation group was given multidisciplinary collaborative continuous nursing and it was compared with the regular continuous nursing in the control group. The results showed that the SAS and SDS scores of the observation group were lower than those of the control group, indicating that multidisciplinary collaborative continuous nursing can reduce patient's anxiety which may be due to the supportive psychotherapy, behavioral therapy, family therapy and other methods for psychological consultation and psychotherapy carried out by the professional psychologists from our multidisciplinary team. Those nursing measures improved the patient's negative emotions and psychological state.

Besides, multidisciplinary collaborative continuous nursing is of great significance for improving the quality of life of patients. He et al. took 100 patients with cervical cancer as the research subjects and randomized them into an observation group and a control group [11]. The control group was given regular nursing after discharge. The observation group received

## Multidisciplinary collaborative continuous nursing on cervical cancer patients

**Table 2.** Comparison of MOS SF-36 for the quality of life score between the two groups (score,  $\bar{x} \pm sd$ )

Indexes	Observation group (n=66)	Control group (n=66)	t	P
Physical functioning	78.17±10.23	65.88±9.21	7.253	0.000
General health	91.62±10.23	85.05±12.11	3.367	0.001
Social role functioning	72.31±11.20	65.83±10.22	3.472	0.001
Emotional role functioning	63.76±9.18	55.52±7.21	5.735	0.000
Mental health	68.23±10.20	57.34±7.21	7.083	0.000

**Table 3.** Comparison of cancer-related fatigue of patients between the two groups (score,  $\bar{x} \pm sd$ )

Cancer-related fatigue	Observation group (n=66)	Control group (n=66)	t	P
Behavioral/severity	2.16±0.32	5.10±0.95	23.826	0.000
Affective meaning	1.95±0.22	5.10±0.81	30.489	0.000
Sensory	1.80±0.23	4.83±0.74	31.766	0.000
Cognition/mood	2.15±0.21	5.50±0.90	29.448	0.000

an intervention of multidisciplinary team care based on the nursing measures performed in control group. This demonstrated that multidisciplinary collaborative continuous nursing is beneficial to improve the quality of life of patients. In this study, the scores of all aspects of the quality of life of patients in the observation group were higher than those of the control group, suggesting that the quality of life of patients in the observation group was better than that in the control group. It once again proved the advantages of multidisciplinary collaborative to continuous nursing, which is consistent with the abovementioned research results.

Cancer-related fatigue is one of the common symptoms of cervical cancer. It is a disturbing, persistent physical, emotional and/or cognitive subjective feeling of fatigue and energy exhaustion caused by tumors or anti-tumor treatments, which influence patients' daily life activities. The symptoms are non-specific weakness, general weakness, decline of physical functioning, lethargy, fatigue, and its incidence reaches from 50% to 95%, which can lead to negative coping strategies, emotions and affect the enthusiasm of patients to cooperate with treatment [24, 25]. In this study, PFS was used to evaluate the cancer-related fatigue of the two groups of patients. We found that the scores of behavioral/severity, affective mean-

ing, sensory and cognitive/mood of patients in the observation group were significantly lower than those of the control group. This suggests that multidisciplinary collaborative continuous nursing can alleviate patients' cancer-related fatigue and enable patients to actively face the disease. In addition, the sleep quality scores of the observation group were lower than those of the control group, showing that the sleep quality of patients in the observation group was better than that in the control group, which proves that multidisciplinary collaborative continuous nursing can improve the sleep quality of patients.

Apart from the cancer-related fatigue, complications are inevitable after surgery and will have a greater negative impact on the prognosis. In this study, the total incidence of complications in the observation group is lower than that in the control group, displaying that multidisciplinary collaborative continuous nursing can reduce the incidence of adverse reactions such as nausea, abdominal pain, wound infection, and intestinal obstruction after cervical cancer surgery, which is of positive significance for early recovery of patients. However, this study did not observe the negative emotions and quality of life of the patients' family members. Research with large samples of long-term care effect should be carried out in the future to confirm the feasibility and importance of the multidisciplinary collaborative continuous nursing in cervical cancer patients.

To sum up, multidisciplinary collaborative continuous nursing applied to patients with cervical cancer has a good effect. It can improve patients' depression, anxiety, quality of life, cancer-related fatigue, patients' sleep quality, and reduce the incidence of complications. Therefore, it is worthy of clinical application and promotion.

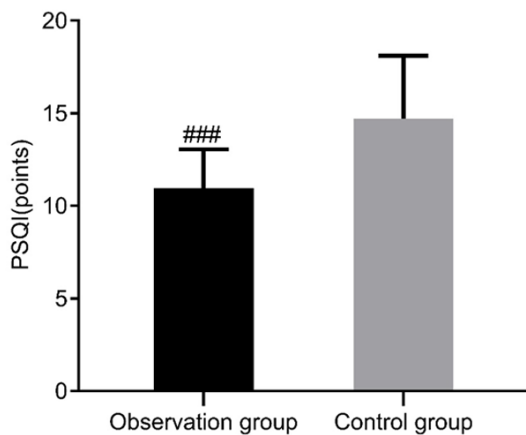
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# Multidisciplinary collaborative continuous nursing on cervical cancer patients

**Table 4.** Comparison of postoperative adverse reactions of patients between the two groups (n, %)

Groups	Nausea	Abdominal pain	Wound infection	Intestinal obstruction	Incidence of complications
Observation group (n=66)	3	2	0	0	7.58
Control group (n=66)	7	3	3	1	21.21
$\chi^2$	1.730	0.210	3.072	1.011	4.980
P	0.188	0.648	0.079	0.315	0.025



**Figure 3.** Comparison of PSQI scores of patients between two groups. Compared with the control group, ###P<0.001. PSQI: Pittsburgh Sleep Quality Index.

Hospital of Xi'an Jiaotong University (2018HL-02).

### Disclosure of conflict of interest

None.

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