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Original Article

Effects of psychological nursing on mood, psychology, sleep and quality of life of patients with cervical cancer after neoadjuvant chemotherapy

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Abstract: Objective: The present study was designed to explore the effects of psychological nursing on the quality of life and negative emotions of patients with cervical cancer after neoadjuvant chemotherapy (NACT). Methods: A total of 154 patients receiving NACT for cervical cancer in our hospital were enrolled and equally divided into observation and control groups with 77 cases each. The control group was treated with routine NACT nursing, and the observation group was supplemented with psychological nursing on the basis of routine nursing. After treatment with different nursing methods, a comparative study was conducted to observe and compare patients' quality of life, negative emotions, mental health and sleep status in the two groups. Results: The total effective rate after NACT did not show significant difference between the OG and CG, which was 71.43% and 68.83% respectively (P>0.05). After nursing intervention, the scores of quality of life, anxiety and depression, mental health and sleep quality of the two groups were significantly improved as compared with those before nursing intervention (P<0.05). And the improvement degree in the observation group was superior to the control group (P<0.05), especially in the fields of role-emotional (P<0.001) and bodily pain (P=0.012). Conclusion: Psychological nursing intervention can improve patients' quality of life, negative emotions represented by anxiety and depression, mental health and sleep quality, which is worthy of clinical application.

Keywords: Psychological nursing, cervical cancer, neoadjuvant chemotherapy, quality of life, negative emotions

Introduction

Cervical cancer is a common gynecological tumor, and its incidence ranks fourth among all female cancer patients worldwide [1, 2]. While in low- and middle-income countries, the incidence of cervical cancer is exceedingly high that it ranks second among gynecological tumors, and this disease is always diagnosed later [3, 4]. Owing to its property of chemosensitivity, chemotherapy has long been used for the treatment of cervical cancer [5]. Neoadjuvant chemotherapy (NACT) refers to the chemotherapy method started before radical tumor resection [6]. Some studies have found that NACT can shrink tumors, thus reducing the scope and difficulty of surgery and decreasing postoperative complications [7, 8].

While treating diseases, the quality of life of patients should also be taken into consideration, and that's also one of the reasons behind the application of NACT, as it can reduce postoperative complications without increasing toxic side effects, thus improving the quality of life of patients to some extent [9]. However, for gynecological tumor patients, tumor itself or the complications might be the last straw that imposes an enormous impact on the mental state of the patients, resulting in anxiety, depression and other negative emotions, which not only affects the patients and their families, but also hazards the prognosis of the patients [10, 11]. Therefore, effective psychological intervention for patients at an early stage is expected to eliminate negative emotions, enable patients to better cooperate

with treatment and improve compliance [12]. In the past, the effect of psychological nursing has not been evaluated in multiple dimensions. Based on this, this study carried out systematic evaluation from multiple dimensions of patients' quality of life, negative emotions, mental health and sleep quality through psychological nursing intervention to explore the application value of psychological nursing in NACT for cervical cancer.

Materials and methods

Clinical data

This study was approved by the medical ethics committee of West China Second Hospital of Sichuan University. From Oct. 2012 to Oct. 2017, 154 patients with cervical cancer diagnosed and scheduled for NACT in West China Second Hospital of Sichuan University were included in this study. The patients were equally divided into observation group and control group by digital table method, 77 cases each. All patients were aged 30-68 years, with an average age of 50.69±8.69 years, and all had signed informed consent forms.

Inclusion criteria

(1) Patients diagnosed with primary cervical cancer [13]; (2) Patients with normal cardiopulmonary function; (3) Patients without any prior related tumor treatment; (4) Patients with normal coagulation and bone marrow function; (5) Patients with complete clinical data.

Exclusion criteria

(1) Patients who had received or were receiving other chemotherapy; (2) Patients with severe cardiopulmonary diseases; (3) Patients with other primary malignant tumors; (4) Patients with abnormal coagulation or bone marrow function; (5) Patients with hepatorenal insufficiency; (6) Patients with allergy or contraindications to chemotherapeutic drugs; (7) Patients with chemotherapy contraindications in routine examination; (8) Patients with little compliance that could not cooperate; (9) Patients without complete clinical data.

The pathological grading (grade I-III) and clinical staging (stage I-IV) of the patients were assessed according to the diagnostic criteria of International Federation of Gynecology and Obstetrics (FIGO) [14].

Research methods

NACT regimens: paclitaxel + cisplatin or carboplatin (TP or TC); docetaxel + cisplatin or carboplatin (DP or DC) chemotherapy for 1-2 weeks [15].

Patients in the control group received routine nursing care during the whole chemotherapy period after admission, mainly including: (1) Close attention to the changes of the patients' condition: The clinical symptoms and signs of the patients were observed every morning, and the changes of the condition were reported and dealt with in a timely manner. (2) Improvement of the environment: While diagnosing and treating the patients, an eye was kept on the environment where the patients were located to ensure clean and tidy, and a relatively comfortably living environment. (3) Dietary guidance: According to the patient's condition and nutritional status, informed the patient of suitable diet and food intake, to avoid eating spicy, irritating, greasy and indigestible food. (4) Guidance on medication: Explained in detail the dosage, time and adverse reactions of the drugs taken by the patients [16].

For patients in the observation group, psychological nursing intervention was conducted by the nurse in charge of each bed on the basis of routine nursing care, with specific methods as follows. Before NACT chemotherapy, the patients' cognition of the disease was made to change through communication and education, so that the patients had a deeper understanding of the disease, including the occurrence and development of the disease, the therapeutic effect and the prognosis, so as to avoid negative emotions caused by patients' lack of understanding. At the same time, the corresponding psychological evaluation was carried out according to the differences of patients' personality and age, in order to formulate different nursing implementation plans. During and after NACT chemotherapy: (1) Emotional support: The emotional support of family members and relatives was maximized to meet the psychological needs of patients, so that patients maintained a positive attitude, with strengthened courage to overcome the disease. In addition, the establishment of a cor-

rect concept was taken into consideration to make sure that patients understand the hazards of long-term fear, anxiety, depression and other negative emotions to the treatment. (2) Psychological resolution and counseling. At each three time points, which were before NACT chemotherapy, one week after chemotherapy and at the end of chemotherapy, the nurse in charge of each bed and the patient had an in-depth communication and conversation for 20-40 minutes. The patients' thoughts and perplexities were understood and answered in time, and the patients with existing mental disorders were counseled and corrected in time. In terms of sleep guidance, patients were instructed to master the regular sleep time, improve sleep quality, keep calm before going to bed, avoid strenuous exercise, and eat as little as possible before going to bed. In addition, the relevant situation of the hospital was introduced to the patients, so that the patients had a better understanding of the medical treatment and nursing care of the hospital, and built up their self-confidence in overcoming the disease. When communicating, professional terms should be avoided to facilitate patients' understanding, and made it clear to patients that the curative effect might vary due to psychological factors. During the course of chemotherapy, the psychological condition of the patients was understood, and soothing music was applied to relax the patients' mood and divert their attention from the pain sensation. The psychological resolution and counseling was performed once a week for about 15 minutes each time. (3) Experience exchange. The department held regular exchange meetings for patients with the same disease, affording the opportunity for patients to share their experience in the treatment of the disease, and allowing their families to care for and support the patients, so that they had a certain degree of mental support. The exchange was carried out once a week, about 30 minutes each time [17].

Outcome measures

Main outcome measures: Efficacy evaluation was performed one month after NACT chemotherapy. (1) The efficacy of NACT was evaluated as complete response (CR), partial response (PR), stable disease (SD) and progressive disease (PD). Among them, CR referred to the complete disappearance of lesions without the occurrence of new lesions, and the tumor markers were all below upper limit value, and the state was maintained for at least 4 weeks. PR meant that the sum of the maximum diameters of the tumor was reduced by at least 30% and maintained for more than 4 weeks. PD referred to the increase of at least 20% in the sum of the maximum diameter of the tumor target lesions compared with the minimum values during the observation period, or the discovery of new lesions. SD meant that the tumor change was between PR and PD, that is, the sum of the maximum diameter of the lesion did not reduce to the PR standard, nor the sum of the maximum diameter of the lesion increased to the PD standard. Effective rate (%) = [complete response (CR) + partial response (PR)]/total number of cases [13]. (2) Quality of life before nursing intervention and 1 month after chemotherapy. The score of quality of life was evaluated according to the MOS item short form health survey (SF-36). With a score ranging from 1 to 100 points, the score was positively correlated with quality of life [18]. (3) Depression and anxiety: The self-rating depression scale (SDS) and the self-rating anxiety scale (SAS) were employed to evaluate the depression and anxiety degree of patients respectively. The higher the score, the more severe the anxiety and depression [19].

Secondary outcome measures: Patients' mental health status and sleep quality were assessed before nursing intervention and one month after chemotherapy. (1) Mental health status: It was scored according to Symptom Check List 90 (SCL-90) scale, and the score was negatively correlated with mental health status [20]. (2) Sleep quality: It was evaluated by Pittsburgh sleep quality index (PSQI). On a 0-21 scale, the score was negatively correlated with sleep quality [21].

Statistical analysis

SPSS 17.0 statistical software was adopted for data analysis, and the continuous variables were expressed as mean ± standard deviation ($\bar{x}$ ± sd). Inter-group comparisons of continuous variables were performed using an independent sample t-test, and multi-group comparisons were realized using paired t-tests,

Table 1. Comparison of general information ($\bar{x}$ ± sd, n (%))

Item	Observation group (n=77)	Control group (n=77)	χ^2/H/t	P
Age (year)	49.73±9.12	51.27±8.78	0.795	0.412
Pathological types			0.356	0.658
Squamous cell carcinoma	69	67		
Adenocarcinoma	8	10		
Pathological grading			0.469	0.595
Grade I	30	28		
Grade II	41	42		
Grade III	6	7		
Clinical stages			0.436	0.803
Stage Ib_2	61	62		
Stage IIa	13	12		
Stage IIb	3	3		
Chemotherapy regimen			0.654	0.621
TP	48	50		
TC	20	19		
DP	5	4		
DC	4	4		

Note: TP or TC, paclitaxel + cisplatin or carboplatin; DP or DC, docetaxel + cisplatin or carboplatin.

Table 2. Comparison of treatment efficacy (n, %)

Treatment efficacy	Observation group (n=77)	Control group (n=77)	χ^2	P
CR	4 (5.19)	5 (6.49)		
PR	51 (66.23)	48 (62.34)	0.550	0.908
SD	16 (20.78)	19 (24.68)		
PD	6 (7.80)	5 (6.49)		
Total effective rate (%)	71.43	68.83	0.124	0.725

Note: CR, complete response; PR, partial response; SD, stable disease; PD, progressive disease.

expressed as t. The rank-sum test was employed to compare the pathological grading variables between groups, represented by H. Paired rank sum test was applied for intra-group comparison, represented by chi-square χ^2. P<0.05 indicates that the difference was statistically significant.

Results

General information

The patients in the observation group were aged 30-67 years (mean age 49.73±9.12 years), and the pathological types were 69 cases of squamous cell carcinoma and 8 cases of adenocarcinoma. While patients in the control group were between 32 and 68 years old (mean age 51.27± 8.78 years old), and were classified as 67 cases of squamous cell carcinoma and 10 cases of adenocarcinoma based on the pathological types. In the aspect of pathological grading, there were 30 cases, 41 cases and 6 cases of grade I-III in the observation group and 28 cases, 42 cases and 7 cases of grade I-III in the control group, respectively. In terms of clinical staging, the patients of stage Ib_2, stage IIa and stage IIb in the observation group were 61, 13 and 3 cases respectively, while those in the control group were 62, 12 and 3 cases, respectively. As to chemotherapy regimen, the TP/TC/DP/DC of the observation group was 48/20/5/4, respectively, and the TP/TC/DP/DC of the control group was 50/19/4/4, respectively. The general data were comparable, and there were no significant differences between the two groups (P>0.05; **Table 1**).

Comparison of treatment efficacy between the two groups

After chemotherapy, the number of cases of CR/PR/SD/PD in the observation group was 4/51/16/6 respectively, with a total effective rate of 71.43%. While in the control group, the number of cases of CR/PR/SD/PD was 5/48/19/5, and the total effective rate was 68.83% (**Table 2**).

Comparison of quality of life scores between two groups of patients before and after nursing intervention

The quality of life score did not show any marked difference between the two groups before nursing intervention (P>0.05), while it was enhanced remarkably in both groups after

Table 3. Comparison of life quality scores ($\bar{x}$ ± sd)

	Before nursing intervention				After nursing intervention			
	Observation group	Control group	t	P	Observation group	Control group	t	P
General health	53.96±9.12	54.09±8.93	0.962	0.369	74.62±12.69[a]	63.21±10.36[b]	3.698	0.025
Mental health	57.61±8.65	57.62±9.51	0.584	0.654	76.36±13.52[a]	66.32±13.20[b]	4.325	0.019
Role emotional	71.65±12.28	70.96±12.48	0.854	0.498	85.16±11.95[a]	76.21±13.64[b]	10.362	<0.001
Social function	68.49±11.69	69.06±11.23	0.796	0.569	80.56±14.69[a]	74.76±12.16[b]	2.946	0.045
Vitality	63.49±11.62	63.21±10.95	0.636	0.519	80.69±14.62[a]	71.28±12.31[b]	3.498	0.027
Bodily pain	59.12±10.03	59.12±9.23	0.862	0.478	71.26±11.29[a]	63.51±10.69[b]	4.264	0.012
Physical function	61.32±10.26	61.52±9.68	0.698	0.559	71.65±14.16[a]	66.54±10.18[b]	3.026	0.031
Role physical	53.16±8.69	52.16±8.96	0.583	0.668	65.29±10.36[a]	56.39±8.95[b]	4.125	0.015

Note: Compared to observation group before nursing intervention, [a]P<0.05; compared to control group before nursing intervention, [b]P<0.05.

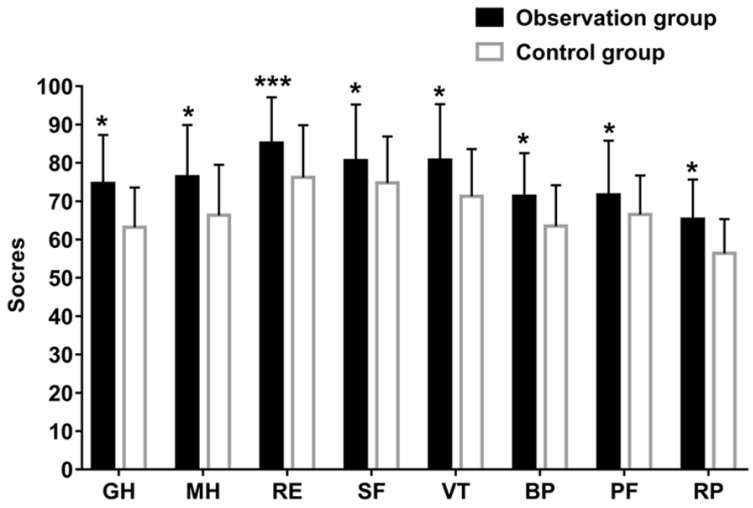

Figure 1. Comparison of life quality scores after nursing intervention. *P<0.05, ***P<0.001, compared between observation group and control group. GH, general health; MH, mental health; RE, role emotional; SF, social function; VT, vitality; BP, bodily pain; PF, physical function; RP, role physical.

nursing intervention (P<0.05). The post-treatment inter-group comparison revealed that the quality of life scores in the observation group were better than those in the control group, with statistical differences (P<0.05), especially in the fields of role-emotional (P<0.001) and bodily pain (P=0.012; **Table 3** and **Figure 1**).

Comparison of anxiety and depression scores between the two groups

No significant differences were observed in anxiety and depression scores (SAS and SDS) between the two groups before the nursing intervention (P>0.05), while after it, the SAS and SDS scores improved profoundly in both groups (P<0.05). The comparison between the two groups indicated that the post-treatment anxiety and depression scores in the observation group were superior to those in the control group, with statistical differences (P<0.05; **Tables 4** and **5**).

Comparison of mental health scores between the two groups before and after nursing intervention

The mental health scores did not differ markedly between the two groups before the nursing intervention (P>0.05), while after it, the mental health scores elevated notably in both groups (P<0.05). The inter-group comparison exhibited that the post-treatment mental health scores in the observation group were superior to those in the control group, with statistical differences (P<0.05; **Table 6**).

Comparison of sleep quality scores between the two groups before and after nursing intervention

Before nursing intervention, there were no significant differences in sleep quality scores between the two groups (P>0.05). While after nursing intervention, the sleep quality scores lowered significantly (P<0.05), and the sleep quality scores in the observation group were

Table 4. Comparison of SDS scores ($\bar{x}$ ± sd)

Treatment efficacy	Observation group (n=77)	Control group (n=77)	t	P
Before intervention	56.31±10.38	56.69±10.37	0.697	0.526
After intervention	42.38±8.62	49.69±9.87	3.365	0.021
t	8.098	4.287		
P	0.001	0.015		

Note: SDS, self-rating depression scale.

Table 5. Comparison of SAS scores ($\bar{x}$ ± sd)

Treatment efficacy	Observation group (n=77)	Control group (n=77)	t	P
Before intervention	60.48±11.25	61.12±11.62	0.598	0.632
After intervention	43.72±8.12	50.21±9.14	3.698	0.016
t	10.283	7.298		
P	<0.001	0.009		

Note: SAS, self-rating anxiety scale.

better than those in the control group (P<0.05), with statistical differences (P<0.05; **Table 7**).

Discussion

Chemotherapy has long been applied in the treatment of cervical cancer due to the chemosensitivity of this disease [5]. While neoadjuvant chemotherapy (NACT) refers to the chemotherapy method started before radical tumor resection [6]. As early as 1999, cisplatin-based concurrent chemoradiotherapy was recommended in the United States [22]. Although previous studies have shown that NACT fails to increase survival rates, there is evidence showing that NACT combined with concurrent chemoradiotherapy can significantly improve the disease-free survival of patients [7, 8, 23, 24]. This study found that cervical cancer was more common in squamous cell carcinoma and was sensitive to chemotherapy. The effective rate in the observation group was 71.43% and the control group was 68.83%, which was consistent with the previous research results [25]. However, the disease itself and the side effects after treatment of cervical cancer jeopardize the quality of life of patients, and affect their psychology, which is easy to induce negative emotions of patients [10, 11].

Nowadays, increasing attention has been paid to the impact of cancer patients' psychology on the prognosis of diseases and quality of life while treating diseases. Some studies have confirmed that the consideration and counseling about the psychology of cancer patients are conducive to improving their mood and quality of life [26]. Cancer itself is a source of stress that heavily imposes on patients, and proactive and correct response to this stress can lead to a better prognosis [27, 28]. According to previous studies, bodily pain seriously jeopardizes the quality of life of patients with cervical cancer. Apart from that, patients are prone to develop psychological shadow and negative emotions [29, 30]. This study also found that the quality of life scores of the two groups of patients after the nursing intervention were far better in the observation group than in the control group, and were more significant in terms of role-emotional and bodily pain, which was in line with the above study. However, the deficiency of the above two studies was that, they only compared the quality of life and negative emotions of patients. While in our study, it was verified through clinical practice that the decline in quality of life and negative emotions had a great impact on the mental health of patients, even in some cases leading to the generation of psychological disorders such as anxiety and depression during the treatment process, and thus affecting the patient's sleep quality. The declined sleep quality, in turn, aggravated the psychological disorders, which further influenced the quality of life and produced a vicious circle [31-36].

Therefore, this study further evaluated the mental health and sleep quality of patients after nursing intervention. Research has demonstrated that positive evaluation of patients' cognitive emotions and adjustment of reattention can bring more benefits to patients' treatment, thus improving patients' negative emotions and mental health [37]. In the present study, the scores of anxiety, depression and mental health were significantly improved after nursing intervention, and the performance in the observation group was significantly better than that of the control group, which was

Table 6. Comparison of mental health scores ($\bar{x}$ ± sd)

	Before nursing intervention				After nursing intervention			
	Observation group	Control group	t	P	Observation group	Control group	t	P
Somatization	2.49±0.51	2.53±0.45	0.968	0.378	1.76±0.23[a]	2.13±0.44[b]	3.745	0.027
Psychosis	2.13±0.37	2.13±0.35	0.584	0.654	1.11±0.12[a]	1.92±0.84[b]	4.426	0.021
Paranoid situation	2.16±0.34	2.14±0.31	0.869	0.512	1.21±0.14[a]	1.93±0.36[b]	5.261	0.002
Fear	2.34±0.57	2.31±0.51	0.802	0.562	1.32±0.27[a]	1.91±0.36[b]	3.125	0.041
Hostility	2.24±0.49	2.22±0.48	0.693	0.521	1.16±0.15[a]	1.93±0.32[b]	3.515	0.030
Anxiety	2.17±0.42	2.16±0.39	0.854	0.514	1.03±0.11[a]	1.75±0.18[b]	4.384	0.019
Depression	2.63±0.61	2.62±0.53	0.703	0.575	1.32±0.25[a]	1.81±0.32[b]	3.154	0.035
Interpersonal sensitivity	2.43±0.47	2.40±0.45	0.603	0.674	1.24±0.11[a]	1.87±0.35[b]	4.024	0.014
Obsessive-compulsive symptoms	2.76±0.62	2.71±0.53	0.584	0.641	1.65±0.26[a]	2.17±0.42[b]	3.459	0.021

Note: Compared to observation group before nursing intervention, [a]P<0.05; compared to control group before nursing intervention, [b]P<0.05.

Table 7. Comparison of sleep quality scores ($\bar{x}$ ± sd)

	Before nursing intervention				After nursing intervention			
	Observation group	Control group	t	P	Observation group	Control group	t	P
Sleep quality	2.11±0.51	2.09±0.49	0.963	0.381	1.30±0.21[a]	1.64±0.27[b]	3.841	0.029
Sleep latency	2.02±0.35	2.03±0.42	0.592	0.667	1.32±0.22[a]	1.62±0.29[b]	4.469	0.019
Sleeping time	2.27±0.53	2.25±0.52	0.741	0.553	1.35±0.26[a]	1.61±0.28[b]	3.364	0.034
Sleep efficiency	2.21±0.51	2.22±0.52	0.793	0.584	1.52±0.34[a]	1.85±0.42[b]	3.269	0.038
Sleep disorders	2.18±0.48	2.23±0.51	0.649	0.496	1.41±0.28[a]	1.73±0.29[b]	2.015	0.047
Hypnotic	2.17±0.37	2.15±0.38	0.625	0.489	1.46±0.23[a]	1.75±0.18[b]	4.384	0.019
Depression	2.63±0.61	2.62±0.53	0.703	0.575	1.32±0.25[a]	1.83±0.29[b]	3.397	0.032
Daytime dysfunction	2.81±0.59	2.83±0.56	0.536	0.621	1.28±0.26[a]	1.85±0.37[b]	4.156	0.018
PSQI total score	18.82±1.02	18.79±1.14	0.732	0.592	11.23±0.46[a]	14.02±0.54[b]	5.232	<0.001

Note: Compared to observation group before nursing intervention, [a]P<0.05; compared to control group before nursing intervention, [b]P<0.05. PSQI, Pittsburgh sleep quality index.

consistent with the preceding research. Women are more prone to poor sleep quality compared with men, plus that women are more sensitive to awakening, which, coupled with psychological anxiety and depression, are more likely to lead to sleep disorders [38]. While the poor sleep quality of patients was improved after psychological nursing intervention, which validated the role of psychological nursing intervention in enhancing patients' sleep quality. In summary, this study evaluated the patients' quality of life, negative emotions represented by anxiety and depression, mental health and sleep quality before and after psychological nursing intervention, and found that psychological nursing had a positive effect and significance in patients with NACT for cervical cancer through comparison of multiple dimensions.

However, there is still room for improvement. For example, this study did not use a multi-center sample to study cases, but only with a single source and a small sample size. Therefore, the sample size should be expanded and multi-center clinical studies should be adopted in the follow-up research.

To sum up, early psychological nursing intervention can improve patients' quality of life, negative emotions of anxiety and depression, mental health and sleep quality, which is worthy of clinical application.

Disclosure of conflict of interest

None.

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