



Original Research

Effect of Fluoxetine on Post-Hysterectomy Nursing of Patients with Endometrial Cancer: A Retrospective Study

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Academic Editor: Michael H. Dahan

Submitted: 30 March 2023 Revised: 8 June 2023 Accepted: 19 June 2023 Published: 17 October 2023

Abstract

Background: The incidence and mortality of endometrial cancer (EC) have increased in recent years. The incidence of psychological disorders induced by EC is also increasing. Fluoxetine is a prescribed antidepressant drug for managing mental illnesses. We retrospectively explored the effect of fluoxetine intervention on symptom checklist 90 (SCL-90), quality of life, Hamilton anxiety scale (HAMA), Hamilton depression scale (HAMD), and nursing satisfaction in patients with EC undergoing surgery. **Methods:** One hundred patients with EC undergoing hysterectomy were selected. Based on the different clinical nursing intervention methods, the patients were categorized into a control group ($n = 50$) and an intervention group ($n = 50$). Patients in the control group were provided routine care, including nutrition guidance, basic psychological nursing, pain care, rehabilitation exercise, and complication prevention, whereas patients in the intervention group were only treated with fluoxetine based on routine nursing protocols. The differences in SCL-90, quality of life, HAMA, HAMD scores, and nursing satisfaction between the two groups were observed. **Results:** No significant difference was observed in the SCL-90, quality of life score, HAMA, and HAMD between the two groups before treatment. After treatment, all items in the intervention group differed from those in the control group. The SCL-90 scores of the intervention group decreased after treatment, and all subscales of SCL-90 in the intervention group were reduced. All dimensions of quality of life were elevated in the control group after treatment. The HAMA and HAMD scores of patients in the intervention group declined considerably after treatment. **Conclusions:** Fluoxetine intervention effectively improved the quality of life of patients with EC undergoing hysterectomy, and ameliorated signs of anxiety and depression, thus promoting the recovery of the disease.

Keywords: fluoxetine; endometrial cancer; anxiety; depression; life quality

1. Introduction

Endometrial cancer (EC) is a malignancy of the endometrium that severely threatens the life and health of patients [1,2]. This cancer mostly occurs in postmenopausal women residing in high-income countries with high obesity rates. Clinical manifestations of EC include irregular vaginal bleeding [3]. Treatment methods primarily used in EC mainly include surgery, radiotherapy, chemotherapy, and endocrine therapy [4]. Total hysterectomy is usually administered in clinical settings. Even though this procedure can prolong the survival of patients, because of the loss of normal uterine physiological functions, patients are prone to depression and anxiety after the surgery, which severely affects their postoperative rehabilitation or may even lead to several negative emotions, such as anxiety, depression, and annoyance [5,6]. These negative feelings that occur post-surgery are closely correlated with the prognosis of patients [7]. Thus, how eliminating negative emotions after surgery has become a key task in postoperative care [8,9]. Corresponding intervention measures are of great significance for reducing mood fluctuations in patients with EC post-surgery and improving their quality of life.

The pathogenesis of depression is complex, and changes in the expression of neurotransmitters have been proven to be an important mechanism in depression [10]. 5-hydroxytryptamine (5-HT) is a neurotransmitter in the pituitary gland and hypothalamus that is closely associated with behavior and emotion [11]. When the level of 5-HT is high, it tends to induce excitement. At low levels, 5-HT can cause people to develop symptoms of anxiety and depression symptoms. Fluoxetine, as a clinical drug used for the treatment of depression, can prolong and increase synaptic 5-HT levels and play the role of an antidepressant [12]. Fluoxetine is a type of so-called selective serotonin reuptake inhibitor with recognized clinical efficacy and safety [13]. Fluoxetine is a Food and Drug Administration (FDA)-approved medicine for obsessive-compulsive, panic disorder, and premenstrual dysphoric disorders [14]. Therefore, this investigation focuses on the clinical efficacy of fluoxetine in ameliorating depression.

Several evaluation systems are applied in assessing the mental state of patients. Symptom Checklist 90 (SCL-90) is a broad measurement of the severity of psychological symptoms [15]. Hamilton anxiety scale (HAMA) and Hamilton



depression scale (HAMD) are both commonly applied in monitoring mood [16]. We focus on the change in assessment systems in patients with EC and compare the discrepancy among the various items. The study included patients with EC and categorized them into a control group and an intervention group to study the post-surgery effect of fluoxetine on patients. The clinical effect of fluoxetine on patients with EC was reflected by SCL-90, HAMA, HAMD, and quality of life score.

2. Materials and Methods

2.1 Study Objects

One hundred patients with EC who underwent treatment at the First Hospital of Xingtai between April 2021 and September 2022 volunteered in this research. All patients met the following criteria: diagnosed with EC by pathological examination; underwent hysterectomy without surgical contraindications; had complete clinical data; had clear consciousness and no communication barriers. Patients with other liver and kidney diseases, heart and brain diseases, mental diseases, other tumors, and a history of surgery were ineligible. The patients had no clinical manifestations of depression before the surgery but showed symptoms of depression after the surgery. The clinical manifestation of depression refers to the third edition of Chinese diagnostic criteria for mental disorders [17]. These volunteers were categorized into a control group ($n = 50$) and an intervention group ($n = 50$) based on different nursing design plans. This grouping method was based on patient preference, and patients who were unwilling to take medication were assigned to the control group. This study was retrospective and performed in line with the principles of the Declaration of Helsinki. The Ethics Committee of the First Hospital of Xingtai approved this plan, and the patients were informed and signed the consent form.

2.2 Clinical Care

The routine postoperative care included dietary care, basic psychological care, pain management, rehabilitation exercise, and complication prevention. (1) Nutritional support involves the guidance and supervision of patients' daily diet, the formulation of scientific diet conditioning plans for patients, and the reasonable arrangements for the daily nutritional intake of patients. (2) Psychological care requires positive and face-to-face communication with patients and their families every day, attending to each patient's psychological feelings of patients promptly, helping patients resolve negative emotions, and helping them get adequate sleep. The attention of patients was diverted and pain perception was alleviated by positive guidance and psychological recommendations. Familial pressure on patients was reduced by training and guiding their family members. (3) Pain management involves asking patients about their pain every day and administering active treatment to help them

alleviate their pain. In addition, patients were also guided to shift their focus to a pain alleviation method. (4) Rehabilitation nursing includes massage of lower limbs, increasing limb activity, and rehabilitation training guidance of the pelvis. (5) Complication care includes informing the patient of possible complications after surgery and managing them promptly and appropriately when they occur.

All patients in the control group and the intervention group were administered active treatment methods, including psychotherapy and positive self-adjustment. Patients in the intervention group were administered fluoxetine (J20170022, Bourgoin Jallieu, Isere, France) twice a day based on the prementioned active treatment methods. The dose of fluoxetine was 20 mg at each instance of administration. The dose was adjusted after 2 weeks of dosing. The whole treatment course was of two months.

2.3 Clinical Effect Assessment

After the 2-month treatment, the scale was assessed independently for each participant. Before the evaluation, the staff explained the general scoring method and requirements. Participants provided self-ratings that were not influenced by anyone and filled the forms out independently. At the end of the assessment, the scales were checked and recorded by clinicians.

The degree of depression of patients was evaluated using the HAMD score [18]. The HAMD score is the sum of the scores of 24 items. Most HAMD projects adopt a five-level scoring method with 0–4 points, and a few projects adopt a three-level scoring method with 0–2 points. The criteria for each level were as follows: 0 = none; 1 = mild; 2 = medium; 3 = severe; 4 = extremely severe. The scoring criteria of the three-level scoring method were as follows: 0 = none; 1 = mild to moderate; 2 = severe. When the score was greater than or equal to 8, it implies that there is depression, and the higher the score, the more serious the situation is.

The anxiety symptoms of patients were estimated using the HAMA score [19]. Higher the HAMA score, the more severe the anxiety symptoms. All HAMA items were scored on a five-point scale from 0 to 4. The criteria for each level were: 0 = no symptoms; 1 = light; 2 = medium; 3 = heavy; 4 = extremely heavy.

Somatization, compulsion, interpersonal sensitivity, depression, anxiety, terror, paranoia, and psychosis constitute of the SCL-90 scoring system [20]. SCL-90 has nine categories, and each category has some items. Each patient scored the item according to five grades. In the SCL-90 table, each item was considered negative if it is less than 2, and positive if the value was greater than or equal to 2. In this study, the average value of positive items in each category was counted. The lower the level, the better the conditions.

Quality of life was assessed using the quality of life questionnaire (QLQ-C30) in a questionnaire survey [21].

Table 1. Comparison of general data between the two groups.

Factors	Control (n = 50)	Intervention (n = 50)	p value
Age (years)	45.68 ± 8.49	45.72 ± 8.91	0.982
BMI (kg/m ²)	24.02 ± 2.89	24.76 ± 2.69	0.188
Marriage			0.182
Yes	47 (94.00%)	43 (86.00%)	
No (spinsterhood, divorce, widowed)	3 (6.00%)	7 (14.00%)	
Education			0.072
Secondary or below	21 (42.00%)	30 (60.00%)	
Post-secondary education	29 (58.00%)	20 (40.00%)	
Age of childbearing (years)			0.646
<30	47 (94.00%)	48 (96.00%)	
≥30	3 (6.00%)	2 (4.00%)	

Note: Data are presented as mean ± standard deviations or n. BMI, body mass index.

Some items are graded on a scale of 1–7, whereas others were graded on a scale of 1–4 and converted into values between 0 and 100.

2.4 Statistical Method

The values were analyzed using the SPSS 20.0 statistical software (IBM Corp., Armonk, NY, USA). *t*-test was conducted to analyze the measurement data, and χ^2 test was performed for enumerating data. $p < 0.05$ indicated a significant difference.

3. Results

3.1 General Clinicopathological Data of Patients with EC

This study collected the demographic information, marital status, education, and childbearing age of all recruited patients. As documented in Table 1, no significant discrepancy was observed between the control group and the intervention group ($p > 0.05$). Thus, the two groups were comparable.

3.2 Comparison of Psychological Health State

In this research, we estimated the psychological status of patients using the SCL-90 rating system. In this rating method, all aspects were evaluated to evaluate the mental health status of patients. All patients showed no obvious difference in the various parameters before treatment ($p > 0.05$, Fig. 1A). The patients in the control group exhibited high levels of respect for somatization, obsessive-compulsive symptoms, depression, anxiety, hostility, terror, paranoia, and psychoticism post-treatment ($p < 0.01$, Fig. 1B). However, no difference was observed in the interpersonal relationships between the control group and intervention group ($p > 0.05$, Fig. 1B). In the control group, a difference was observed in hostility before and after treatment ($p < 0.001$, Table 2). All subscales showed differences in the intervention group before and after treatment ($p < 0.001$, Table 2). This indicates that the two groups showed differences in most mental health parameters.

3.3 Fluoxetine Influenced the Quality of Life in Patients with EC

Six aspects were performed to assess the quality of life of patients. No difference was observed in all aspects before treatment ($p > 0.05$, Fig. 2A). However, after treatment, the quality-of-life score was high in all dimensions ($p < 0.001$, Fig. 2B). The results in Table 3 documented that physical function, physiological function, body pain, and emotional function were higher in the control group after treatment ($p < 0.05$, Table 3). All respects in the quality-of-life scores were elevated in the intervention group after treatment ($p < 0.001$, Table 3).

3.4 Fluoxetine Impeded Anxiety and Depression

The HAMA score and HAMD score were decreased in the intervention group than control group after the treatment ($p < 0.001$, Figs. 3,4). The HAMA and HAMD scores both declined in patients after treatment compared with that before treatment ($p < 0.001$, Table 4).

3.5 Satisfaction Feedback from All Patients

Nursing satisfaction was divided into five grades. As shown in Table 5, the total satisfaction rate in the intervention group was elevated compared with the control group ($p < 0.05$).

4. Discussion

EC has shown a continuous and rapid growth trend among gynecological tumors in recent years. The condition severely affects the overall physical and psychological health of women, making patients very prone to negative emotions and affecting their quality of life [22,23]. Psychological factors are inseparable from the process of the disease [24]. When the body is in a state of stress, there will be negative emotions, such as anxiety and tension, are bound to occur. These negative emotions also weaken the immune function of the body, thus reducing its ability to resist external invasion. It leads to poor prognosis for patients and is not conducive to their quality of life in the future [25].

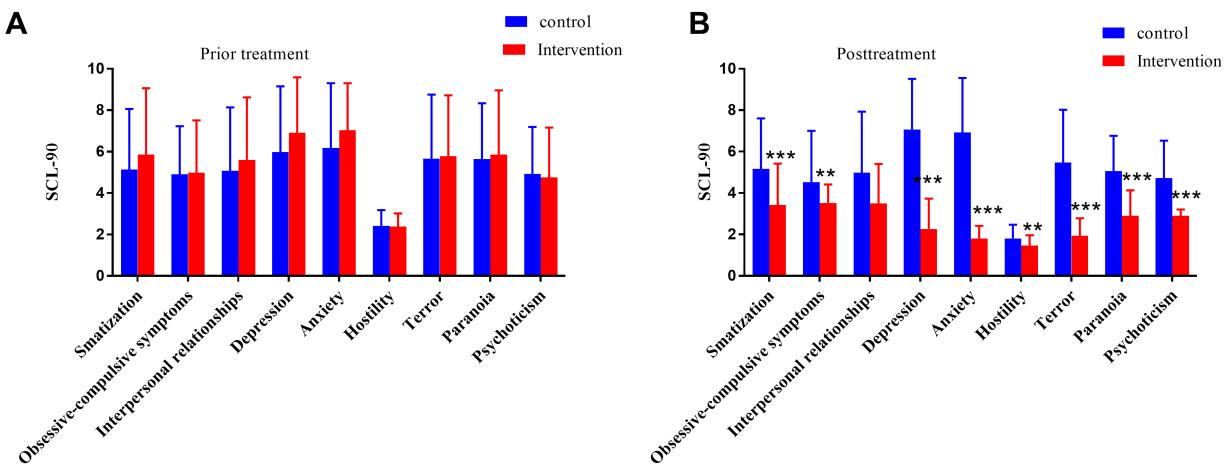


Fig. 1. Detection of symptom checklist 90 (SCL-90). (A) The discrepancy in the SCL-90 score before treatment. (B) The difference in SCL-90 score after treatment. ** p < 0.01, *** p < 0.001, relative to control group.

Table 2. SCL-90 self-rating scale scores were compared between the two groups.

Factors	Control (n = 50)		t	p	Intervention (n = 50)		t	p	F	p
	before	after			before	after				
Somatization	5.14 ± 2.92	5.16 ± 2.44	-1.06	0.916	5.86 ± 3.20	3.42 ± 2.00	4.73	<0.001	15.17	<0.001
Obsessive-compulsive symptoms	4.90 ± 2.33	4.52 ± 2.48	0.82	0.415	4.98 ± 2.53	3.52 ± 0.89	4.17	<0.001	7.23	0.008
Interpersonal relationships	5.08 ± 3.06	4.98 ± 2.95	0.17	0.869	5.60 ± 3.02	3.50 ± 1.90	4.57	<0.001	8.89	0.004
Depression	5.98 ± 3.17	7.06 ± 2.45	-1.77	0.083	6.92 ± 2.67	2.26 ± 1.47	11.11	<0.001	140.97	<0.001
Anxiety	6.18 ± 3.12	6.92 ± 2.63	-1.26	0.215	7.04 ± 2.26	1.80 ± 0.61	15.10	<0.001	180.57	<0.001
Hostility	2.42 ± 0.76	1.80 ± 0.67	3.97	<0.001	2.38 ± 0.64	1.46 ± 0.50	8.67	<0.001	8.23	0.005
Terror	5.66 ± 3.09	5.48 ± 2.54	0.32	0.754	5.78 ± 2.94	1.94 ± 0.84	9.05	<0.001	87.40	<0.001
Paranoia	5.64 ± 2.70	5.06 ± 1.70	1.29	0.204	5.86 ± 3.10	2.90 ± 1.23	6.47	<0.001	55.71	<0.001
Psychoticism	4.92 ± 2.28	4.72 ± 1.81	0.60	0.551	4.75 ± 2.41	2.90 ± 0.30	5.46	<0.001	48.47	<0.001

Note: SCL-90, Symptom Checklist 90. Data are presented as mean ± standard deviations.

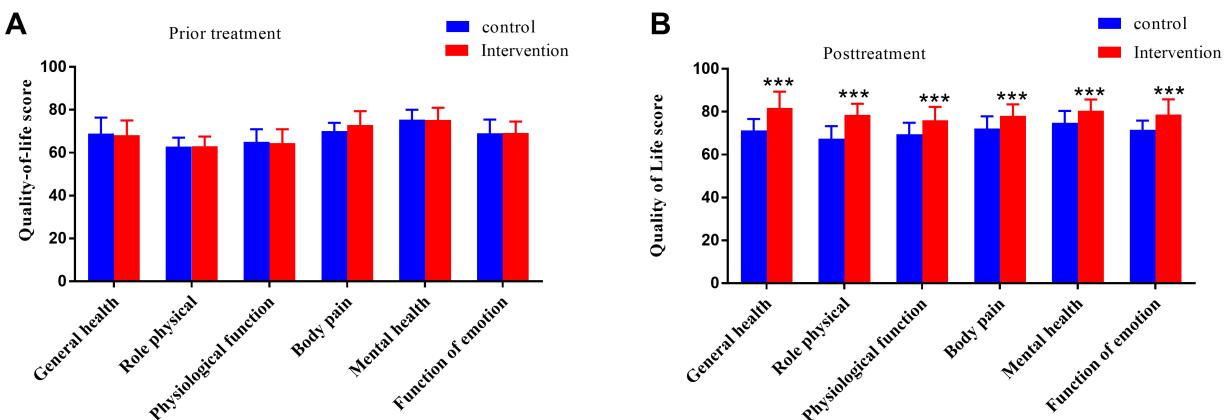


Fig. 2. Comparison of the quality-of-life score. (A) No difference in quality-of-life scores prior treatment. (B) All dimensions were elevated in the intervention group after treatment. *** p < 0.001, relative to control group.

Many women with cancer experience severe anxiety and depression after undergoing surgical resection [26]. Therefore, it is necessary to adopt effective nursing measures to

eliminate the negative emotions of patients and improve life quality.

Table 3. Comparison of quality-of-life scores before and after intervention between the two groups.

Factors	Control group (n = 50)		t	p	Intervention group (n = 50)		t	p	F	p
	before	after			before	after				
General health	68.84 ± 7.55	71.28 ± 5.36	-1.82	0.075	68.12 ± 6.96	81.82 ± 7.59	-9.39	<0.001	64.32	<0.001
Role physical	62.84 ± 4.19	67.48 ± 5.80	-4.97	<0.001	63.00 ± 4.56	78.58 ± 5.12	-15.66	<0.001	103.00	<0.001
Physiological function	65.02 ± 5.93	69.56 ± 5.28	-3.89	<0.001	64.44 ± 6.49	76.08 ± 6.23	-8.87	<0.001	31.87	<0.001
Body pain	70.07 ± 3.88	72.18 ± 5.72	2.51	0.016	72.90 ± 6.49	78.16 ± 5.27	-4.79	<0.001	76.90	<0.001
Mental health	75.34 ± 4.71	74.86 ± 5.48	0.41	0.687	75.22 ± 5.75	80.46 ± 5.28	-4.09	<0.001	27.05	<0.001
Function of emotion	69.00 ± 6.47	71.56 ± 4.33	-2.10	0.041	69.22 ± 5.31	78.66 ± 7.11	-8.14	<0.001	36.37	<0.001

Note: Data are presented as mean ± standard deviations or n.

Table 4. Comparison of HAMA and HAMD scores between the two groups.

Factors	Control (n = 50)		t	p	Intervention (n = 50)		t	p	F	p
	before	after			before	after				
HAMA	15.62 ± 2.27	13.12 ± 1.38	6.20	<0.001	15.32 ± 2.24	7.68 ± 1.27	20.40	<0.001	421.15	<0.001
HAMD	16.44 ± 2.42	13.52 ± 2.60	5.90	<0.001	15.60 ± 2.19	7.18 ± 1.41	22.02	<0.001	229.10	<0.001

Note: HAMA, Hamilton Anxiety Scale; HAMD, Hamilton Depression Scale. Data are presented as mean ± standard deviations.

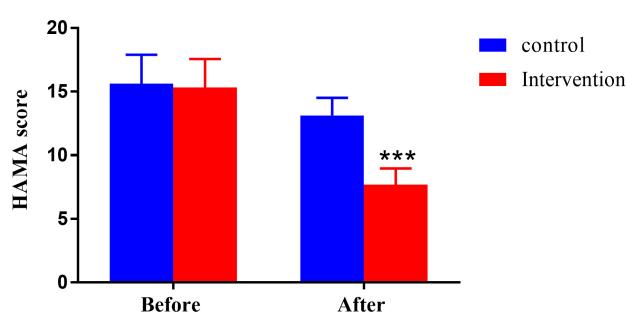


Fig. 3. The Hamilton anxiety scale (HAMA) score in the two groups showed no difference before treatment, while it decreased in the intervention group after treatment. *p < 0.001, relative to control group.**

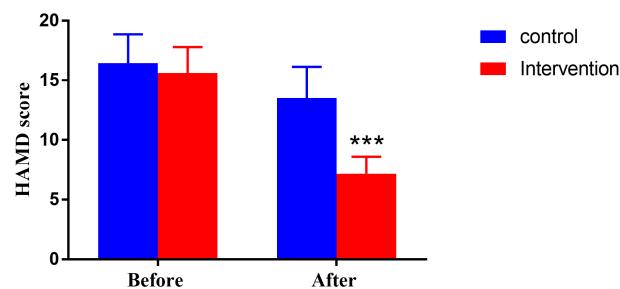


Fig. 4. The depression degree was reflected by the difference in Hamilton depression scale (HAMD). *p < 0.001, relative to the control group.**

Depression medication is a commonly used choice in clinical practice. Fluoxetine is an antidepressant and anxiety drug and a potent and highly selective serotonin reuptake inhibitor [27]. Oral fluoxetine is completely absorbed

in the gastrointestinal tract and not affected by food intake or the combination of antacids. It is distributed rapidly and widely distributed in various tissues. Fluoxetine is one of the oldest drugs applied for managing some mental illnesses, like major depressive disorder, hypochondria, anxiety, bulimia nervosa, and obsessive-compulsive disorder [28]. A systematic review reported that fluoxetine is effective in treating psychological symptoms in patients with premenstrual and infertility disorders [29]. Another investigation by Alenko *et al.* [30] indicates that an 8-week treatment with fluoxetine helps reduce psychological symptoms in patients with major depressive disorder. In addition, the peripheral changes may influence the central nervous system, thus inducing depression [31,32]. The receptors of fluoxetine are widely distributed in the peripheral nervous systems, thus, fluoxetine may affect depression by regulating peripheral effects [33]. In an animal trial, fluoxetine is proven to exert antidepressant and analgesic effects [34]. The analgesic effects of fluoxetine may also enhance its lowering effect on depression. Thus, this research focused on the efficacy of fluoxetine in patients with EC.

The SCL-90 phobic anxiety scale is a valid measure of psychiatric manifestations and extensively applied in psychogenic research [35]. This scoring system is utilized for patients with frontotemporal depression, affective disorders, and mental manifestations of allergic rhinitis [36–38]. This current research reported that the SCL-90 score was decreased after treatment and the intervention group had a lower level than the control group, suggesting that fluoxetine could improve the mental health status of patients. In the control group, only hostility was decreased, while in the intervention group, all parameters, including SCL-90, declined obviously, reflecting that fluoxetine improved the psychosomatic symptoms. Then, we further estimated the quality of life through QLQ-C30. After treatment, all

Table 5. Nursing satisfaction was compared between the two groups.

Factors	Control (n = 50)	Intervention (n = 50)	χ^2	p value
Very satisfied (n/%)	17 (34.00)	22 (44.00)		
Satisfied (n/%)	16 (32.00)	20 (40.00)		
Generally satisfied (n/%)	8 (16.00)	6 (12.00)	5.01	0.025
Unsatisfied (n/%)	9 (18.00)	2 (4.00)		
Total satisfaction rate (n/%)	41 (82.00)	48 (96.00)		

subscales in the QLQ-C30 scale were elevated in the intervention group relative to that in the control group, providing that fluoxetine could improve life quality and accelerate the rehabilitation process. Thirdly, the HAMA and HAMD systems were conducted to assess mental sickness. After treatment, the HAMA and HAMD scores of the two groups were decreased, and the scores in the intervention group were lower, indicating that fluoxetine in the treatment of depression can not only effectively improve depression but also significantly relieve anxiety. Finally, nursing satisfaction was improved in the intervention group, indicating that the combination of fluoxetine and routine nursing is more easily accepted and welcomed by patients.

5. Conclusions

Totally, fluoxetine treatment along with routine care could effectively reduce the overall psychological complaints, ameliorate anxiety and depression, and reduce the pain of patients with EC, thus improving their quality of life. This method of aftercare for patients with EC undergoing hysterectomy is functional and worth adopting in clinical settings.

Abbreviations

EC, endometrial cancer; HAMA, Hamilton anxiety scale; HAMD, Hamilton depression scale; QLQ-C30, quality of life questionnaire; SCL-90, symptom checklist 90; 5-HT, 5-hydroxytryptamine.

Availability of Data and Materials

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Author Contributions

All authors contributed to the study conception and design. Material preparation, data collection and analysis were performed by WJY, LLW, JW and LW. The first draft of the manuscript was written by NS and all authors commented on previous versions of the manuscript. All authors read and approved the final manuscript. All authors contributed to editorial changes in the manuscript. All authors have participated sufficiently in the work to take public responsibility for appropriate portions of the content and agreed to be accountable for all aspects of the work in ensuring that questions related to its accuracy or integrity.

Ethics Approval and Consent to Participate

This study was performed in line with the principles of the Declaration of Helsinki. The Ethics Committee of the First Hospital of Xingtai approved this plan (approval number: 2020-015), and the patients were informed and signed the consent form.

Acknowledgment

Not Applicable.

Funding

This research was funded by Medical Science Research Project of Hebei Province, grant number: 20232008.

Conflict of Interest

The authors declare no conflict of interest.

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