

# The impact of hospital-family integrated continuation nursing based on information technology on patients unhealthy mood, family function and sexual function after cervical cancer surgery

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## Abstract

The objective of this study was to explore the impact on hospital-family integrated continuation care based on information technology on the negative emotions, family function, and sexual function of patients after cervical cancer surgery. The clinical case data onto 114 postoperative cervical cancer patients who were nursing in our hospital from July 2019 to July 2021 were selected and were divided into a control group and an observation group. The control group used routine nursing care, and on this basis, the observation group used information technology as the basis for hospital-family integrated continuation care, and we observed and compared the differences in the 2 groups of patients bad mood, family function, and sexual function. The score of anxiety ( $P = .017$ ), depression ( $P = .009$ ), fatigue rating ( $P = .012$ ), and anger ( $P < .001$ ) in the observation group after care were significantly lower than those in the control group. Problem solving, role, emotional response, emotional involvement, and family function total score in the observation group after care was significantly lower than those in the control group ( $P < .05$ ). Sexual desire score, sexual arousal score, vaginal lubrication score, orgasm score, sexual satisfaction score, dyspareunia score, and Female Sexual Function Inventory total scores in the observation and control groups after care were significantly higher than those before care ( $P < .05$ ). The sexual function scores in the observation group after care was significantly higher than those in the control group ( $P < .05$ ). The hospital-family integrated continuation care based on information technology is more effective than conventional nursing care for patients after cervical cancer surgery.

**Abbreviation:** FSFI = female sexual function inventory.

**Keywords:** bad mood, cervical cancer, continuous nursing, hospital-family integration, sexual function

## 1. Introduction

Cervical cancer is the 4th most common cancer in women, and the 7th overall, with an estimated 604,127 new cases and 341,831 deaths in 2020.<sup>[1]</sup> The age of onset of patients is gradually younger and has been on the rise in recent years. Comprehensive treatments such as surgery, chemotherapy, and radiotherapy can effectively prolong the survival time of cervical cancer patients.<sup>[2]</sup> However, many patients lack recovery. Nursing knowledge makes patients prone to negative emotions and sexual disorders after discharge, which reduces the quality of life of patients.<sup>[3,4]</sup> Hospital-family integrated continuation

care is an extended care service developed to meet the discharge needs of patients.<sup>[5–9]</sup> It can not only improve the quality of medical services, but also extend the quality of medical services to patients after they are discharged from the hospital, improving patients awareness and self-management of diseases ability to improve the treatment effect of patients after discharge from the hospital and improve the quality of life of patients.<sup>[10]</sup>

Hospital-family integrated continuity nursing is a new nursing concept that has been proposed in recent years. It refers to the nursing concept and improvement methods to ensure that patients receive continuous and coordinated

L-PL and D-FR contributed equally to this work.

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nursing services in different rehabilitation places or different levels of medical institutions.<sup>[11]</sup> Usually, this refers to the follow-up service and guidance after the patient returns to the family or the community by the medical institution.<sup>[9,12]</sup> It is mostly used for patients with a long rehabilitation course, large physical and mental impact before and after surgery, and chronic disease.<sup>[13]</sup> Previous studies have shown that patients with cervical cancer are more likely to experience sexual dysfunction as a result of their cancer treatment in the long run.<sup>[14]</sup> After hysterectomy, it will affect the shape and function of the patient's private parts, sexual life and psychological state, resulting in an excessive psychological burden on the patient and a reduction in the quality of life, thereby affecting family harmony.<sup>[15,16]</sup>

Therefore, how to grasp the patient's condition changes after the patient is discharged from the hospital and ensure the continuation of follow-up rehabilitation treatment and nursing services is a problem that needs to be paid attention to after a wide range of cervical cancer patients undergoing hysterectomy. Song et al<sup>[9]</sup> have shown that the hospital-family integrated continuation care can effectively improve the quality of life, relieve depression, and reduce the incidence of complications in patients with liver cancer. Cheng and colleagues showed that the hospital-family integrated continuation care was applied for patients with nasopharyngeal cancer helps improve their self-care ability and satisfaction with care, improves quality of life, and promotes recovery.<sup>[8]</sup> Choosing appropriate nursing methods is important for the patient's physical and mental recovery and life after surgery. The improvement of quality of life has a greater impact.<sup>[17]</sup> We used continuation of care for 114 patients after cervical cancer surgery, and explored the impact of hospital-family integrated continuation care based on information technology on the negative mood, family function, and sexual function of patients after cervical cancer surgery.

## 2. Materials and Methods

### 2.1. Study design and population

According to the prevalence of the disease, the sample size was computed by using the formal:  $n = Z^2 (p * q) / d^2$ . Take  $Z = 1.96$ , where  $p$  is the overall rate,  $q = 1 - p$ . Let  $P = .8$ ,  $d$  is a fraction of  $p$ . Finally, a total of 114 patients after cervical cancer surgery treated in our hospital from July 2019 to July 2021 were selected. Inclusion criteria as follows: All patients in this study met the diagnostic criteria for cervical cancer in the "2019, NCCN Clinical Practice Guidelines in Oncology,"<sup>[18]</sup> and had been diagnosed as stage I and stage II patients with cervical cancer in the hospital; The selected patients were treated for cervical cancer surgery treated in our hospital. No history of tumor metastasis and pelvic surgery, education level above elementary school; Clear awareness, and able to express their wishes correctly, after the informed consent of cervical cancer patients, respect the wishes of the patient's family members to participate in research activities. Cervical cancer patients have smartphones and use social software such as WeChat.

#### 1.2.1. Exclusion criteria

- (1) Patients with severe complications such as central nervous system damage, coronary heart disease, hypertension, and blood disease.
- (2) Patients with incomplete clinical data.
- (3) Patients with communication and understanding disorders, patients with other tumors, patients with family members concealing the condition, patients who are not expected to be followed up for cervical cancer.
- (4) Patients with lower urethral obstruction and expected survival time less than 1 year with severe organic disease.

The study was approved by the Ethics Committee of the Wuhan NO.1 Hospital. All methods were carried out in accordance with STROBE guidelines and regulations for humans.

### 2.2. Method

The control group adopts routine care, namely; Observe the changes of the condition closely: observe the systemic symptoms of patients after cervical cancer surgery, record the body conditions, such as fatigue, weight loss, fever, pain, skin conditions, etc, whether there is bone marrow suppression, adverse reaction; Activity: before surgery, you can perform appropriate activities according to your own conditions. When you have fever or bone marrow suppression, you should absolutely rest in bed to reduce consumption, protect the body, and prevent falls. After the operation, you should get out of bed as soon as possible according to your own conditions to prevent deep vein thrombosis of the lower limbs and prevent postoperative intestinal adhesions; Diet: formulate a weekly diet table for patients after cervical cancer surgery, mainly high-protein, low-fat, and rich in vitamins. The first day after surgery: mostly liquid food, keep the temperature at an appropriate degree, and pay attention to the vegetable ingested, you can squeeze vegetable juice, convenient to drink, pay attention to constipation. On the second day, observe the patient's physical condition after cervical cancer surgery. Patients with poor physical condition, you can give semiliquid foods such as millet porridge, chicken soup, eggs and other high-protein and easy-to-absorb foods. Pay attention to the amount from less to more, from thin to thick. The principle of adding from 1 kind to many kinds. On the third day, mainly high-protein foods, such as soy milk, egg whites, chicken, etc, eat smaller meals and pay attention to the principle of meat and vegetable collocation. On the 4th day, you can eat whole grains and high-fiber foods to prevent constipation. Staying in bed for a long time and reducing exercise will cause constipation. On the 5th day, you can resume your diet, but pay attention to the principle of adding from 1 to many, eat smaller meals more often, and pay attention to nutrition; Keep skin clean: after cervical cancer surgery, the family members of the patient should wipe their bodies regularly every day to keep the skin clean to prevent the generation of germs. The water temperature should be appropriate, preferably around 32 to 34 degrees. Indwelling catheterization for cervical cancer surgery after that, the patient should have the nurse scrub the perineum twice a day to keep it clean; Functional exercise: instruct the patient and spouse to carry out physical function rehabilitation training together: Kegel pelvic floor muscle rehabilitation exercise method. It can assist patients with simple yoga exercises, walking, jogging, and gymnastics training to improve their mood and have a good positive attitude; Psychological care: explain the treatment and good prognosis of the disease to patients and their spouses after cervical cancer surgery, strengthen the understanding of the disease of patients and their families after cervical cancer surgery, and eliminate fears. Through various evaluations of patients after cervical cancer surgery, a targeted psychological care plan is formulated, and the plan is truly implemented, so that patients after cervical cancer surgery can have a positive attitude toward life and a stable and healthy mood.

On this basis, the observation group used information technology as the basis for hospital-family integrated continuity care, that is; The department first established a medical care treatment team, each group was bound by a physician in charge and 2 nurses in charge. The physician in charge who worked from Monday to Friday, the nurse in charge takes turns to work, and one of the nurses is guaranteed to be on duty every day from Monday to Sunday to ensure the continuity of patient care and reduce the chance of information attenuation; The department organizes training related systems, diagnosis and treatment plans, nursing points, and

**Table 1****Comparison of general information between the 2 groups.**

| Group                  | Average age (yr) | Body mass index (kg/m <sup>2</sup> ) | Course of disease (mo) | Cervical cancer staging |    |     |     |
|------------------------|------------------|--------------------------------------|------------------------|-------------------------|----|-----|-----|
|                        |                  |                                      |                        | Ia                      | Ib | IIa | IIb |
| Control group (57)     | 56.78 ± 11.32    | 26.76 ± 3.32                         | 6.34 ± 3.55            | 23                      | 14 | 11  | 9   |
| Observation group (57) | 56.62 ± 11.56    | 26.69 ± 2.66                         | 5.29 ± 3.64            | 24                      | 13 | 12  | 8   |
| $\chi^2/t$             | 0.054            | 0.124                                | 1.133                  | 0.161                   |    |     |     |
| <i>P</i> value         | .957             | .901                                 | .263                   | .984                    |    |     |     |

related content of health education to achieve homogeneity of treatment and education; When a patient is admitted to the hospital, the doctor in charge and the responsible nurse will welcome the new patient together. The doctor, nurse, patient, and family members will be bound together to establish an integrated diagnosis and treatment team with a family of doctors, nurses and patients, and establish a harmonious relationship between doctors, nurses and patients; Send pens and notebooks to patients and their families after cervical cancer surgery to inform patients and their families that they can record their feelings and needs at any time within a day after cervical cancer surgery; The family members of doctors, nurses and patients will be handed over at the bedside at 8:00 AM After cervical cancer surgery, patients and their family members will report their feelings and needs through the recorded content. The nurse will report on the patient's condition changes, medication use, and psychological changes the previous day. The doctor reports the patient's examination results; Individualized diagnosis and treatment plans are jointly formulated by doctors, nurses, patients and their family members, and the family members of the doctors and nurses jointly implement diagnosis and treatment measures, and members of the quality control team of the department evaluate the treatment effect; Monthly follow-up by telephone after discharge to understand the patient's physical adaptation status after discharge. Instruct patients to understand the occurrence, development and prognosis of the disease, and guide patients to maintain a regular life during the treatment of the disease, ensure adequate sleep, appropriate activities, and increase the amount of activity and activity intensity according to the physical condition. Pay attention to personal hygiene, change underwear frequently, wash the perineum every day, give vaginal douche according to the doctor's instructions if necessary, and take a shower for bathing. Sexual life can be resumed 3 to 6 months after discharge; WeChat public account: within 3 months after the patient is discharged from the hospital, according to the characteristics of the progress of the recovery time of the cervical cancer patient after the operation, the relevant information about the care of the cervical cancer patient will be pushed according to different batches at different time periods. The content is pushed in the form of pictures and videos, and several topics are subdivided in each time period, mainly including: cervical cancer related knowledge, pelvic floor muscle exercise skills, management of complications and daily life guidance, questions and answers, case nursing, couples emotional life guidance, couples psychological counseling. These themes need to be combined with some characteristic pictures while playing, and then some music or confession should be added appropriately.

### 2.3. Observation indicators

After cervical cancer surgery, patients will be scored for negative emotions and evaluated according to the "The Brief Profile of Mood States," including anxiety, depression, fatigue, and anger, each item is 0 to 7 points, the higher score

indicates the greater emotional response. The above scale is the simplest and most commonly used method for evaluating subjective pain. It is easy for patients to understand and accept and has good reliability and validity. The Cronbach  $\alpha$  value is >0.962, and it is highly sensitive and convenient for recording; Family function: evaluation of the patient's family function items include problem solving, communication, role, emotional response, emotional intervention, behavior control and general function, etc There are a total of 60 items, and the scoring range of each aspect is between 1 and 4 points. The lower score indicates the better family function. The Cronbach  $\alpha$  coefficient of this scale is 0.726; The female sexual function inventory (FSFI) contains 19 concise self-evaluation items, covering 6 dimensions related to sexual function, namely: sexual desire (2 items), sexual arousal (4 items), vaginal lubricity (4 items), orgasm (3 items), sexual satisfaction (3 items) and intercourse pain (3 items). The 19 items are all hierarchical, set to 0 to 5 levels, the higher FSFI total score, the better presentation function. According to Wiegel et al research on the FSFI scale, a female's total score of sexual function is <26.55 points is judged as sexual dysfunction. If the total score of sexual function is >26.55 points, but the vaginal lubrication dimension score is <4.35 points, it is also judged as female sexual dysfunction. The FSFI Scale has been widely recognized internationally and has been translated into different languages. As an effective tool for evaluating female sexual function, its validity coefficient is 0.953, and the Cronbach  $\alpha$  coefficient is 0.81 to 0.92. It has a good reputation.

### 2.4. Statistical methods

We used EpiData to enter all the data, and then use SPSS 25.0 to perform statistical analysis. The data was entered into the computer database by a person and checked and corrected by a second person to ensure the completeness and accuracy of the data. For the measurement data represented by the mean  $\pm$  standard deviation. The count data expressed in percentage (%) in this study adopts Fisher exact probability test or  $\chi^2$  test, and statistically  $P < .05$  is meaningful.

## 3. Results

### 3.1. Baseline clinical characteristics

The mean age of the observation group was 56.62 ± 11.56 years and that of the control group was 56.78 ± 11.32 years. The average disease duration of the observation group was 5.29 ± 3.64 years and that of the control group was 6.34 ± 3.55. The body mass index of the observation group was 26.69 ± 2.66 kg/m<sup>2</sup> and that of the control group was 26.76 ± 3.32 kg/m<sup>2</sup>. With regards to cervical cancer staging, the observation group had 24 cases with Ia, 13 cases with Ib, 12 cases with IIa, and 8 cases with IIb. The control group had 23 cases with Ia, 14 cases with Ib, 11 cases with IIa, and 9 cases with IIb (Table 1).

### 3.2. Comparison of negative emotions

The negative emotions of patients after cervical cancer surgery mainly include anxiety, depression, fatigue and anger. The score of anxiety ( $P = .017$ ), depression ( $P = .009$ ), fatigue rating ( $P = .0172$ ), and anger ( $P < .001$ ) in the observation group after care were significantly lower than those in the control group (Table 2).

### 3.3. Comparison of family function evaluation

Family function evaluation in the observation and control groups after care were significantly lower than those before care ( $P < .05$ ). Problem solving, role, emotional response, emotional involvement, and family function total score in the observation group after care was significantly lower than those in the control group ( $P < .05$ ) (Table 3).

### 3.4. Comparison of sexual function

Before nursing, there was no significant difference in the sexual function scores of the 2 groups of patients after cervical cancer surgery ( $P > .05$ ). Sexual desire score, sexual arousal score, vaginal lubrication score, orgasm score, sexual satisfaction score, dyspareunia score, and FSFI total scores in the observation and control groups after care were significantly higher than those before care ( $P < .05$ ). The sexual function scores in the observation group after care was significantly higher than those in the control group ( $P < .05$ ) (Table 4).

## 4. Discussion

Hospital-family integrated continuous care refers to the formation of a fixed team of doctors, nurses, patients, and family members. From the time the patient is admitted to the hospital, fixed medical staff will provide patients with comprehensive and individualized medical care according to the conditions and needs of the patients and their families.<sup>[19]</sup> Our research aims to evaluate the effect of hospital-family integrated continuation care in patients with concurrent radiotherapy and chemotherapy for cervical cancer.<sup>[20]</sup> Studies have shown that applying

the integrated medical care rounds model to concurrent radiotherapy and chemotherapy for cervical cancer is conducive to promoting the recovery of patients, alleviating anxiety and depression of patients, reducing the occurrence of complications, and improving the quality of life of patients.<sup>[21]</sup> A qualitative study of medical staff's cognition and attitude towards patient reporting outcomes shows that the interviewed medical staff generally hold a positive and open attitude towards the concept of patient reporting outcomes, and nursing staff should formulate scientific and feasible application plans to promote patients.<sup>[22]</sup>

After nursing in this study, the anxiety, depression, fatigue, and anger of the 2 groups of patients after cervical cancer surgery were significantly improved, and the emotional response score of the observation group was significantly lower than that of the control group. Hospital-family integrated continuous nursing can effectively improve the mood of patient's reaction. The reasons for the analysis are as follows: anxiety and depression are the 2 most common emotional reactions of patients. Anxiety is a kind of irritability caused by excessive worry about the safety and future of their loved ones or their own lives.<sup>[23]</sup> Depression is a kind of negative emotions such as pessimism, sadness, and despair. Hospital-family integrated continuation care is an advanced nursing model that aims to improve patients awareness of patients after cervical cancer surgery through effective health education for patients, to improve the life of patients after discharge from the hospital.<sup>[24]</sup> Continuing care is helpful to stabilize the patient's mood and reduce anxiety. After continuation care intervention, from the results of anxiety scores, the patient's psychological condition has improved, and postoperative infertility will cause a huge blow to patients without children. The comfort of the psychiatrist and the enlightenment of the psychologist can clearly see the reduction of the coke oven situation.<sup>[25]</sup> At the same time, continuous nursing intervention can significantly reduce the negative mentality of patients, so that they can maintain an optimistic mentality. After discharge from the hospital, continuous nursing intervention can shorten the distance between nurses and patients, truly care about patients, and help patients get out of the haze of infertility.<sup>[26]</sup>

After nursing in this study, the problem solving, communication, role, emotional response, emotional involvement, behavior control, and total functional scores of the observation group

**Table 2**

Comparison of bad mood between the 2 groups.

| Group                  | Anxiety score |             | Depression score |             | Fatigue rating |             | Anger score |             |
|------------------------|---------------|-------------|------------------|-------------|----------------|-------------|-------------|-------------|
|                        | Before care   | After care  | Before care      | After care  | Before care    | After care  | Before care | After care  |
| Control group (57)     | 6.31 ± 0.51   | 4.03 ± 1.24 | 6.00 ± 0.13      | 3.37 ± 0.34 | 5.54 ± 0.45    | 3.95 ± 0.32 | 6.25 ± 0.32 | 4.71 ± 0.51 |
| Observation group (57) | 6.30 ± 0.52   | 2.35 ± 0.26 | 6.01 ± 0.12      | 1.57 ± 0.30 | 5.53 ± 0.44    | 2.27 ± 0.41 | 6.26 ± 0.31 | 2.95 ± 0.52 |
| <i>t</i>               | 0.104         | 10.011      | 0.427            | 29.971      | 0.12           | 24.387      | −0.169      | 18.243      |
| <i>P</i> value         | .908          | .017        | .67              | .009        | .905           | .012        | .866        | <.001       |

**Table 3**

Comparison of family function evaluation between the 2 groups.

| Group                  |             | Problem solved | Communication | Role          | Emotional response | Emotional involvement | Behavior control | Family function total score |
|------------------------|-------------|----------------|---------------|---------------|--------------------|-----------------------|------------------|-----------------------------|
|                        |             |                |               |               |                    |                       |                  |                             |
| Control group (57)     | Before care | 20.64 ± 0.31   | 28.49 ± 5.24  | 35.27 ± 0.14  | 20.27 ± 2.23       | 24.21 ± 2.31          | 30.39 ± 4.75     | 36.23 ± 5.08                |
|                        | After care  | 17.68 ± 1.47   | 21.89 ± 5.66  | 28.23 ± 1.37  | 15.25 ± 1.82       | 19.23 ± 0.57          | 26.42 ± 4.79     | 29.25 ± 5.07                |
| <i>P</i> value         |             | .015           | .036          | .008          | .016               | .029                  | .041             | .003                        |
| Observation group (57) | Before care | 20.16 ± 0.20   | 28.31 ± 4.36  | 35.21 ± 0.32  | 20.14 ± 1.29       | 24.27 ± 1.21          | 30.64 ± 3.31     | 35.49 ± 3.74                |
|                        | After care  | 11.29 ± 0.61*  | 17.20 ± 3.52  | 17.23 ± 0.68* | 12.15 ± 0.46*      | 14.26 ± 0.37*         | 15.68 ± 3.47     | 21.89 ± 3.66*               |
| <i>P</i> value         |             | .037           | .012          | <.001         | .029               | .031                  | .017             | <.001                       |

Compared with control group.

\* Indicates  $P < .05$ .



**Table 4**  
**Comparison of evaluation of sexual function between 2 groups.**

| Group                  |             | Sexual desire score | Sexual arousal score | Vaginal lubrication score | Orgasm score | Sexual satisfaction score | Dyspareunia score | FSFI total score |
|------------------------|-------------|---------------------|----------------------|---------------------------|--------------|---------------------------|-------------------|------------------|
| Control group (57)     | Before care | 1.27 ± 0.14         | 0.77 ± 0.13          | 0.81 ± 0.21               | 0.84 ± 0.21  | 1.27 ± 0.14               | 1.27 ± 0.23       | 6.24 ± 1.72      |
|                        | After care  | 2.23 ± 0.57         | 1.25 ± 0.22          | 1.63 ± 0.37               | 1.15 ± 0.34  | 2.23 ± 0.57               | 2.25 ± 0.32       | 12.27 ± 2.65     |
| P value                |             | .007                | .042                 | .013                      | .039         | .017                      | .027              | .002             |
| Observation group (57) | Before care | 1.27 ± 0.11         | 0.75 ± 0.06          | 0.79 ± 0.15               | 0.79 ± 0.19  | 1.24 ± 0.33               | 1.31 ± 0.24       | 6.23 ± 1.57      |
|                        | After care  | 3.23 ± 0.45*        | 2.25 ± 0.42*         | 2.83 ± 0.57*              | 2.85 ± 0.64* | 3.27 ± 0.21*              | 3.21 ± 0.51*      | 17.24 ± 3.53*    |
| P value                |             | .023                | .015                 | .009                      | .019         | .011                      | .028              | <.001            |

Compared with control group.

FSFI = female sexual function inventory.

\* Indicates  $P < .05$ .

were lower than those of the control group, indicating that the hospital-family integrated continuation care was implemented for patients after cervical cancer surgery. Improve the patient's family function. The specific reasons are as follows: the family occupies an important position in the life of an individual, and the various elements in the family system are interconnected, influenced and restricted. Any change in one of the elements will directly affect the changes in other factors, even affect the change of the whole family's overall nature and behavior.<sup>[27]</sup> The hospital-family integrated continuity nursing work model breaks the original model of 2 parallel lines between doctors and patients, nurses and patients, and rebuilds a new 4-in-1 work pattern of doctors, nurses, patients, and family members, bringing closer the medical, nursing, and nursing work patterns. The distance between the 4 members of the patient's family.<sup>[28]</sup> Hospital-family integrated continuity care is to conduct joint rounds, each with its own emphasis but seamless communication. The rounds model realizes the bedside handover, so that the needs of patients can be solved at the bedside, and zero-distance service is realized.<sup>[29]</sup> At the same time, patients with this measure can record the discomfort and needs of the previous day in real time, and report them to the medical staff 1 by 1 during the next day's rounds, reducing the loss of disease information. The doctor in charge will inform the patients and their families 1 by 1 of the results of the medical examination and the appointment time for the examination. The responsible nurse will record the patient at the bedside, arrange a reasonable order, and give corresponding health guidance to make the patient's treatment and care plan more reasonable, so as to achieve the best treatment plan.<sup>[30]</sup> In addition to the treatment and health education while in the hospital, the responsible nurse also guides some key points of rehabilitation and self-care after discharge, so as to ensure the continued care of patients after discharge from the hospital.<sup>[31]</sup> Patients provide personal feelings and opinions on disease treatment care-health care services, and family members provide their own needs, changing the past disease-focused work model to a patient-centered model, providing patients with a more human culture and personality. It is transformed into a medical care model, which emphasizes the cooperation of patients and their families, and the cooperation between doctors and nurses to improve the medical experience of patients.<sup>[32]</sup>

After nursing in this study, the observation group's sexual desire score, sexual arousal score, vaginal lubrication score, orgasm score, sexual satisfaction score, dyspareunia score and FSFI total score after cervical cancer surgery were compared with the same group of pre-nursing and control group nursing. In the past, few people paid attention to the issue of sexual function in patients with cervical cancer after treatment. This is mainly because Chinese people have more conservative attitudes and behaviors towards sex than Westerners. In traditional Chinese families, the discussion of sexual problems is still taboo. In many articles we have found that Chinese people are very uncomfortable when talking about private matters.<sup>[33]</sup> Furthermore, because Chinese medical staff have misunderstandings about

the purpose of disease treatment, they have not paid much attention to the sexual function of patients with cervical cancer. Cervical cancer patients not only have physical symptoms after treatment but are also accompanied by psychological problems and pressure from the relationship between the sexes. These will seriously affect the sexual function of patients with cervical cancer and reduce their quality of life.<sup>[34]</sup> At present, there is no theoretical framework for the sexual function of cervical cancer patients after treatment at home and abroad, and the factors that affect sexual function are not very certain. Based on the domestic and foreign literature reports in recent years, the factors affecting the sexual function of patients after cervical cancer treatment are comprehensive and interactive, including disease and treatment-related factors, patient psychological factors, age factors, education level, medical staff Sexual health guidance for patients, the concept of sexual partners, etc.<sup>[35]</sup> Through hospital-family integrated continuity care, we have to conduct joint rounds, each with its own emphasis but seamless communication. The rounds model realizes the bedside handover, so that the needs of patients can be solved at the bedside, and 0-distance service is realized.<sup>[36]</sup> At the same time, patients with this measure can record the discomfort and needs of the previous day in real time, and report them to the medical staff 1 by 1 during the next day's rounds, reducing the loss of disease information. Hospital-family integrated continuation care has better recovery of sexual function in patients after cervical cancer surgery.<sup>[37]</sup>

Through this event, we realized that continuous care intervention has practical benefits for patients and can really help patients solve a series of problems. When the patient is unable to solve some small problems, they do not need to register to consult these small problems again. This not only wastes the patient's time and money, but also causes a certain waste of medical resources. On the other hand, the continual care plan can shorten the time for patients to see a doctor. Some minor problems can be solved through online consultation, which saves patients' time, improves economic efficiency, and has many benefits to the hospital. It can not only improve the hospital's economics. Benefits, saving medical costs, and allowing more patients to register, avoiding the waste of medical resources. The research is based on patients with cervical cancer after surgery, exploring the establishment of an out of-hospital continuation nursing intervention program for young and middle-aged cervical cancer patients, providing patients with continuation of the body and mind during the rehabilitation process of hospitalization and discharge; testing the effects of continuation nursing interventions on cervical cancer. The marital status of surgical patients and the improvement of long-term quality of life after surgery provide guidance for the application of continuous nursing intervention in such patients. Cervical cancer patients are not only physically shocked, but also psychologically traumatized. After the patient is discharged from the hospital, continuous nursing interventions can track the patient's condition in time without losing contact with the patient, and truly solve the various problems of the patient after the operation. By

giving practical care, when the patient does not understand, it can help the patient to answer the question in time and bring the nurse-patient relationship closer.

The current study had several limitations that should be acknowledged. First, our sample consisted solely of stage I and stage II patients with cervical cancer from China. Patients from different countries and patients with stage III and stage IV were not included in this study, which might cause selection bias. Second, the single-center and a small sample size setting. Therefore, future studies with large sample size are needed to verify these findings.

## 5. Conclusions

In summary, the use of information-based methods for hospital-family integrated continuation of nursing care for patients after cervical cancer surgery is better than conventional nursing care alone, while promoting the recovery of bad mood and further improving the family function and sexual function of patient's status, provide some reference for choosing nursing methods for patients after cervical cancer surgery. More importantly, further studies with multicenter, well-designed, and large sample size are needed to be conducted to explore the impact on hospital-family integrated continuation care based on information technology on the negative emotions, family function, and sexual function of patients after cervical cancer surgery in the future.

## Author contributions

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