

# The Effect of Case Management on Improving the Quality of Life of Breast Cancer Patients in Chemotherapy

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## To cite this article:

Litao Zhang, Ming Xie, Caimei Hong. The Effect of Case Management on Improving the Quality of Life of Breast Cancer Patients in Chemotherapy. *World Journal of Public Health*. Vol. 5, No. 2, 2020, pp. 42-46. doi: 10.11648/j.wjph.20200502.13

Received: April 19, 2020; Accepted: May 11, 2020; Published: June 4, 2020

**Abstract:** Objective: The study attempts to explore the effect of case management on improving the quality of life of breast cancer patients in chemotherapy. Methods: We selected 138 patients who were pathologically diagnosed with breast cancer and were receiving chemotherapy in our department, and averagely divided them into control group and observation group. The control group was given usual nursing care and telephone follow-up after discharge while in the observation group, case management model was employed besides the intervention the control group received. After that, we observed the quality of life and the total incidence of adverse reactions (myelosuppression, gastrointestinal discomfort, skin reaction, allergic reaction, infusion tube related complications, etc.) of the two groups. We used the quality of life questionnaire made by the European Organization for Research and Treatment of Cancer (EORTCQLQ-C30) to evaluate the quality of life of the two groups and compared that between the two groups before and after intervention. Results: During chemotherapy, the score on somatic function, role function, emotional function, social function, cognitive function and general health of the observation group was higher than that of the control group ( $P < 0.05$ ). Besides, the total incidence of adverse reactions of the observation group (30.43%) was significantly lower than that of the control group (53.62%) ( $\chi^2 = 7.614$ ,  $P = 0.000$ ). Conclusions: Case management for breast cancer patients in chemotherapy can reduce adverse reactions caused by chemotherapy and increase treatment compliance so as to improve the quality of life of patients.

**Keywords:** Breast Cancer, Chemotherapy, Adverse reaction, Case Management, Quality of Life

## 1. Introduction

Breast cancer is of the highest incidence among female malignant tumors and maintains an upward trend [1]. The major treatment for breast cancer is surgery combined with chemotherapy, radiotherapy, endocrinotherapy, molecular targeting treatment and other therapies [2]. Chemotherapy as one of the major treatment for breast cancer is likely to cause gastrointestinal discomfort, myelosuppression, hand-foot syndrome, allergic reaction and many other adverse reactions [3-4]. The adverse reactions reduce the quality of life of patients and the treatment effect [5]. Traditional nursing care is only given during hospitalization and rehabilitation nursing after discharge is hard to be provided. As a result, various discomfort occurring in chemotherapy cannot be treated in

time. Currently, precise individualized nursing care to motivate patients to participate in the rehabilitation plan for themselves so as to encourage patients to comply with treatment is good for their recovery. What's more, case management is not limited by time and space. The case management, through case manager for tumor, based on multi-specialist team including specialist physicians, professional nurses and other medical staff, provides individualized, thorough and professional guidance and consultation for patients to ensure complete treatment and care for individual patient [6]. In order to reduce adverse reactions in chemotherapy and improve the quality of life of patients, we provided one-on-one case management services for 138 breast cancer patients in chemotherapy from December 2017 to November 2018 and achieved satisfactory results.

## 2. Data and Methods

### 2.1. General Data

We included 138 patients who were pathologically diagnosed with breast cancer and received chemotherapy in our department from December 2017 to November 2018. They are averagely divided into control group and observation group. The inclusion criteria were that: I patients were pathologically diagnosed with breast cancer and received chemotherapy as adjuvant therapy for four courses of treatment, and their breast cancer was at the stage I, II or III in TNM classification; II that the patients were at the age from 23 to 75, conscious, and had no other tumors and severe diseases; III that informed consents were obtained from patients and they had basic ability to communicating and understanding. Exclusion criteria were that: I patients had communication disorder or cognitive behavior disorder; II the breast cancer was complicated by other tumors or severe diseases; III the breast cancer was at the advanced stage and there was multiple systemic metastases or the prognosis was poor. There was no significant difference in the age, body mass index (BMI), manner of operation, TNM stage and other general data between the two groups ( $P > 0.05$ ) as shown in the Table 1.

### 2.2. Methods

#### 2.2.1. Control Group

The patients in the control group received usual nursing care and the nurse in charge instructed the patients on precautions for chemotherapy during hospitalization. Telephone follow-up was provided one week after discharge to follow the discomforts of patients in chemotherapy and to tell the patients to consult their doctors and nurses in charge if there were any uncomfortable symptoms.

#### 2.2.2. Case Management for the Observation Group Based on the Interventions for the Control Group

1) We set up a case management team consisting of an associate chief physician, an attending doctor, an associate chief nurse, a nurse-in-charge, two nurse practitioners and a case manager, and formulated the case management process for breast cancer and assignment of duties. The head of department and head nurse are responsible for the implementation of the case management system and the control of the case management quality.

2) Qualifications of a case manager: a bachelor degree or above, specialist nurse in breast surgery, obtaining the qualification of a lymphedema therapist, having the qualification of public dietician level 3, over 10 years of experience in galactophore department, solid accumulation of clinical expertise, good communication and coordination ability, having been in the Buddhist Tzu Chi Hospital and Koo Foundation Sun Yat-Sen Cancer Center for further communication of case management for breast cancer.

3) The case manager took part in the treatment since the pathological diagnosis. The case manager gave self-introduction, exchanged contact information with the

patients and their family members, and introduced the content and duties of the case management work. After obtaining the consent of the patient and family members, case manager asked them to sign the informed consent. Then case manager invited patients or their families to enter the WeChat group of doctors and patients, asked them to follow the public account of breast surgery, encouraged patients to actively consult case managers if confronted with any questions, and also encouraged the patients to support each other and exchange their experiences.

4) We used the breast cancer follow-up system to establish a case management file for breast cancer patients (including the patient's general situation, family support, economic status, nutritional status, traffic condition, etc.).

5) The public account delivered at least 3 pieces of science knowledge about breast diseases and the latest cutting-edge rehabilitation knowledge about breast cancer treatment every week.

6) We distributed rehabilitation manuals for breast cancer patients and explained the manual to patients and their families item by item, including: functional exercise, lymphedema prevention, arm circumference measurement, dietary nutrition guidance, psychological mood, guidance on sexual life and reproduction, follow-up requirements and projects, etc.

7) We conveyed early, middle and late postoperative rehabilitation exercises for breast cancer to the patients and told them to exercise every day after discharge for the sake of recovery of the affected limb function. According to the 18<sup>th</sup> precaution in "Behavior Guidelines for Lymphedema Prevention" issued by the National Lymphedema Network (NLN) in 2005, we provided universal guidance for patients [7].

8) After the pathological diagnosis, the case manager discussed the chemotherapy plan with the doctor in charge. Then the case manager explained the treatment plan to the patient and family members in detail, including the chemotherapy plan, treatment course, precautions for chemotherapy, adverse reactions and countermeasures and treatment compliance, etc. When nausea, emesis and other gastrointestinal symptoms were serious, patients were told to inform the doctor in charge in time, and if necessary, to take medication.

9) Weekly telephone or WeChat follow-up after discharge was provided, and patients were asked to contact the case manager if having any questions after leaving the hospital. The follow-up mainly concerned about the patient's adverse reactions to chemotherapy and bone marrow suppression, reminded patients to take blood routine and liver function reexamination weekly and to send the results to the case manager. Since the beginning of the first course of treatment, changes in the absolute counts of white blood cells and neutrophils in patients were paid attention to, and reported to the doctor in charge to determine whether to increase white blood cells and whether to give preventive increase in white blood cells in subsequent chemotherapy [8]. The time of the next course of chemotherapy was informed.

10) The case manager used the follow-up system to find out patients who needed to return to the hospital for chemotherapy on the day, and used the follow-up system to send messages to remind the patients to return to hospital for the treatment.

### 2.3. Outcome Measurements

We observed the improvement in the quality of life and overall incidence of adverse reactions (myelosuppression, gastrointestinal discomfort, skin reactions, allergic reactions and infusion tube related complications, etc.) during chemotherapy in both groups. We adopted the quality of life questionnaire developed by the European Organization for Research and Treatment of Cancer (EORTCQLQ-C30) [9] to assess the quality of life of patients from five dimensions: physical function, role function, emotional function, social function, cognitive function and overall health. A standardized score was used. The higher the score, the better the function.

### 2.4. Statistical Methods

We used SPSS20.0 for analysis. The data were shown as mean±standard deviation. We adopted  $\chi^2$  test for analysis of enumeration data and two sample T test for analysis of measurement data. And  $P < 0.05$  indicates significant difference.

## 3. Results

### 3.1. General Data of the Two Groups

There was no significant difference in the age, body mass index (BMI), manner of operation, TNM stage and other general data between the control group and observation group ( $P > 0.05$ ) as shown in the table 1.

Table 1. Comparison of the General Data between the Two Groups [case (%)].

Item	Control group (n=69)	Observation group (n=69)	t/ $\chi^2$	P
age	48.14±11.57	48.07±9.83	0.040*	0.072
BMI (kg/m <sup>2</sup> )	22.95±3.08	23.60±2.97	0.674*	0.502
Manner of operation [case (%)]				
Modified radical operation	27 (39.13)	28 (40.58)	0.030 <sup>#</sup>	0.862
Breast conserving surgery	18 (26.08)	17 (24.64)	0.038 <sup>#</sup>	0.845
Mastectomy	24 (34.78)	24 (34.78)	0.000 <sup>#</sup>	1.000
TNM stage [case (%)]				
Stage I	6 (8.70)	5 (7.25)	0.099 <sup>#</sup>	0.753
Stage II	41 (59.42)	44 (63.77)	0.276 <sup>#</sup>	0.600
Stage III	22 (31.88)	20 (28.99)	0.137 <sup>#</sup>	0.711

Notice: \* represents t, and # stands for  $\chi^2$ .

### 3.2. Comparison of Score on the Quality of Life Between the Two Groups

There was a significant difference in the score of EORTCQLQ-C30 after intervention between the control group and observation group ( $P < 0.05$ ) as shown in the Table 2.

Table 2. Comparison of Score on the Quality of Life (EORTCQLQ-C30) between the Two Groups.

Group	Case	Somatic function		Role function		Emotional function	
		Before intervention	After intervention	Before intervention	After intervention	Before intervention	After intervention
Observation group	69	60.62±34.67	74.95±9.38	30.12±32.64	57.04±4.04	41.62±14.88	78.35±6.78
Control group	69	63.12±12.74	49.94±7.65	34.85±22.66	43.83±6.29	43.12±11.52	57.18±8.21
t			17.153		15.453		16.523
P			0.000		0.000		0.000

Table 2. Continued.

Group	Cognitive function		General health	
	Before intervention	After intervention	Before intervention	After intervention
Observation group	76.53±19.38	87.31±6.82	57.64±17.45	64.04±6.91
Control group	73.24±25.46	72.56±8.77	50.72±12.88	41.47±9.22
t		11.019		16.264
P		0.000		0.000

Notice: t represents the comparison between the two groups after intervention.

### 3.3. Comparison of Total Incidence of Adverse Reactions During Chemotherapy Between the Two Groups

There were adverse reactions to different degrees in patients of the observation group but the total incidence (30.43%) was significantly lower than that of the control group (53.62%) ( $\chi^2=7.614$ ,  $P=0.000$ ) as shown in the Table 3.

**Table 3.** Comparison of Incidence of Adverse Reactions during Chemotherapy between the Two Groups [case (%)].

Group	Case	Myelosuppression	Gastrointestinal discomfort	Skin reaction	Allergic reaction	Infusion tube related complication	Total incidence
Observation group	69	6 (8.70)	5 (7.25)	7 (7.25)	1 (1.45)	2 (2.90)	21 (30.43)
Control group	69	10 (14.49)	12 (17.39)	9 (14.49)	3 (4.35)	3 (4.35)	37 (53.62)
$\chi^2$							7.614
P							0.006

## 4. Discussion

The treatment plan for breast cancer is complicated and the treatment usually takes a long time. Chemotherapy is one of the main treatment methods for breast cancer. However, the adverse reactions caused by chemotherapy bring a series of discomforts to the patients. At the same time, the patients have to suffer from fear of diseases, lack of postoperative rehabilitation knowledge, pain of breast loss, and uncertainty about the disease, etc. [10]. The patients undergo numerous physical and psychological tests, which seriously affects their quality of life. Case management, starting from the diagnosis of breast cancer in patients, involves assessment, plan, implementation, evaluation, feedbacks and other dynamic, continuously repeating, and improving treatment and rehabilitation measures for patients [11]. It provides patients with personalized health guidance on diet, functional exercise, prevention of lymphedema, coping with adverse reactions to chemotherapy, etc. and ensures timely communication and coordination between patients and their doctors in charge and other team members on the problems that occur during the treatment. As a result, the case management helps alleviate the discomfort caused by the treatment-induced complications and motivate the patients to actively participate in their own treatment and rehabilitation plan, increasing their treatment compliance, which is conducive to their recovery.

In the current study, on the basis of routine care in the control group, case management is employed in the observation group and the five functional dimensions and overall health status of the two groups were compared before and after intervention. The results show that there is no significant difference in the score between the two groups before intervention ( $P > 0.05$ ). After intervention, the score of the observation group is significantly higher than that of the control group ( $P < 0.05$ ). It indicates that the implementation of case management services is conducive to the physical and mental health of the patients and improves the patients' treatment compliance, self-management ability and quality of life.

Through implementation of case management, the total incidence of myelosuppression, gastrointestinal discomfort, skin reactions, allergies, infusion tube-related complications and other adverse reactions during chemotherapy of the observation group (30.43%) is significantly lower than that of the control group (53.62%) ( $\chi^2 = 7.614$ ,  $P = 0.000$ ). In the control group, focus is mainly on patients receiving chemotherapy in hospital, but the management cannot be ensured after discharge. However, in the observation group,

through case management, patients are informed in detail of the side effects of chemotherapy and coping methods prior to chemotherapy. After discharge, patients can consult their doctors about any questions. The case manager provides professional rehabilitation knowledge, consultation and psychological support for the patients and solves their doubts so as to reduce their panic and anxiety, improve their self-care ability, and alleviate the side effects and discomfort caused by chemotherapy. Throughout the treatment period, the case manager takes the initiative to care for patients, pay attention to their treatment effects and side effects, and ensure that the patients complete chemotherapy as planned. Chen Yuzhi *et al.* [12], after more than ten years of experience in cancer case management, find that case management during treatment and continuous follow-up and care after discharge from the hospital can improve patients' treatment compliance and self-management ability, and reduce the incidence of complications. Some studies [13, 14] also find that, continuous care for cancer patients during chemotherapy can improve the patients' compliance behavior and self-management ability, reduce the adverse reactions to chemotherapy, and improve the quality of life of patients, which is consistent with the present study.

## 5. Conclusions

In summary, case management for patients with breast cancer, especially those who are receiving chemotherapy, can reduce side effects caused by chemotherapy which is conducive to the physical and mental health of the patients. It can also increase patients' treatment compliance and self-management ability so as to improve the quality of life of patients. The current study only pays attention to the effect of case management on patients receiving chemotherapy. However, the treatment plan for breast cancer is complicated and the treatment commonly takes a long time. Accordingly, it is necessary to conduct case management throughout the whole treatment period and further study will focus on the effect of it.

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