Correlations between Fatigue, Social Support and Psychological Resilience of Patients with Recurrent Ovarian Cancer

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To analyze the correlations between fatigue, social support and psychological resilience of patients with recurrent ovarian cancer. 70 patients treated from January 2019 to June 2020 and scheduled to undergo cytoreduction or chemotherapy again were selected as the subjects. A questionnaire survey was conducted, including general socio-demographic questionnaire, fatigue assessment inventory, social support rating scale and Connor-Davidson resilience scale. Univariate and multivariate regression analyses were performed to explore the influencing factors for fatigue, social support and psychological resilience. Spearman's analysis was employed to investigate the correlations of fatigue with social support and psychological resilience. The fatigue assessment inventory score was (4.71±0.65) points. There were 26 cases (37.62 %) of general fatigue, 33 cases (47.14 %) of moderate fatigue, and 11 cases (15.71 %) of severe fatigue. The total social support score and scores of objective support, subjective support and utilization of social support were (33.48±7.68), (8.71±2.82), (17.65±3.89) and (6.82±1.65) points, respectively. Life stress event and monthly per capita income (0-1000 Chinese yuan renminbi) were independent risk factors for social support score. The scores of psychological resilience, self-improvement, tenacity and optimism were (63.10±10.04), (2.51±0.57), (2.37±0.36) and (2.29±0.25) points, respectively. Age (≥61 y old) and chronic disease were independent risk factors affecting fatigue score and psychological resilience score. In addition, fatigue was significantly negatively correlated with social support (r=-0.694) and psychological resilience (r=-0.589) in patients with recurrent ovarian cancer (p<0.05). Patients with recurrent ovarian cancer have high degree of fatigue, which is closely associated with social support and psychological resilience. Medical workers should make the most of social support system to reduce the fatigue degree.

Key words: Recurrent ovarian cancer, fatigue, social support, psychological resilience

As one of the three major malignancies in women, ovarian cancer has the highest mortality rate among gynecological tumors. Coupled with the special location of the lesion and the lack of early diagnosis means, patients have often been the late stage when they see a doctor. In recent years, with the development of comprehensive treatment regimens, the 5 y survival rate has been dramatically improved. However, most ovarian cancer patients have to suffer multiple relapses during their survival, which results in negative emotions such as anxiety and depression, causing serious psychological and physical trauma to patients and remarkably lowering the quality of life of patients[1]. In addition, the spouses or main caregivers of the patients need to not only change their lifestyle to satisfy the care needs, but also sacrifice their personal entertainment time and social activities for nursing. As a result, long term care tasks also affect the physical and mental health of the patients' spouses or main caregivers, thus causing family crisis and disrupting family harmony[2,3]. Hence, in this study, fatigue, social support and psychological resilience of patients with recurrent ovarian cancer were investigated and their influencing factors and correlations were analyzed to help patients with recurrent ovarian cancer better adapt to family role changes, thereby improving their quality of life.

MATERIALS AND METHODS

General data:

Seventy patients diagnosed as recurrent ovarian cancer that were treated in our hospital from January 2019 to June 2020 and scheduled to undergo cytoreduction or chemotherapy again were selected as the subjects.

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Ovarian cancer recurrence was confirmed based on the diagnostic criteria by the International Gynecologic Cancer Society were measurable tumor diameter increase >20 %, or Cancer Antigen 125 (CA 125) value in secondary detection greater than or equal to twice the minimum value of remission in the previous treatment, presence of any measurable or non-measurable new lesions and definite progression of tumor related disease conditions. The exclusion criteria were extremely weak or dying patients or those with cognitive disorders such as disturbance of consciousness, mental illness, orientation disorder or impaired memory. All the patients were pathologically diagnosed with epithelial ovarian cancer in the first operation. They were 29-80 y old, with an average of (50.89±8.72) y old. Ovarian cancer relapsed 1-3 times; with duration from the start to the end of recurrence of 2-30 mo and the median interval of recurrence was 11 mo.

Survey tools:

The general socio-demographic questionnaire, Fatigue Assessment Inventory (FAI), Connor-Davidson Resilience Scale (CD-RISC) and Social Support Rating Scale (SSRS) were utilized to survey the demographic features, fatigue, social support and psychological resilience of the subjects. The Chinese version of FAI translated by Chinese scholars in 2000 was adopted. It contains 29 items, each of which is divided into seven levels from "totally disagree" to "totally agree"[4]. The scoring criteria were as follows: <4 points=no fatigue, ≥4 points and <5 points=general fatigue, ≥5 points and <6 points=moderate fatigue and ≥6 points=severe fatigue. The Cronbach's Alpha (α) value of the scale ranges 0.70-0.92, so the internal consistency reliability of the scale is good. The Chinese version of CD-RISC was used[5]. It consists of three dimensions as tenacity, self-improvement and optimism, with a total of 25 items. Each item is scored in five grades (0-4 points), and the total score is 100 points. The higher the score, the better the psychological resilience. The Cronbach's α value of the scale is 0.91, suggesting good consistency reliability. The compiled SSRS was employed, which contains 10 items in 3 dimensions, including 3 items for objective support, 4 items for subjective support, and 3 items for utilization of social support[6]. The total social support score is the sum of the scores of the 10 items and the higher the total score and the score of each dimension, the more the social support.

Methods of obtaining data:

Questionnaire survey was the major method for obtaining data in this study. Specifically, the purposes and filling instructions of the survey were explained to the patients. Patients with a high educational level filled in the scales by themselves. Meanwhile, the nursing staff read the content of scales item by item to the patients with a low educational level to assist them in completing the questionnaire survey. The questionnaires were checked at the end of the survey to ensure that there were no missing items. There were 70 subjects with recurrent ovarian cancer in this study and 70 questionnaires were recovered (recovery rate was 100 %), of which 70 were valid (effective rate was 100 %). The data were input and validated by two persons to ensure their accuracy.

Statistical analysis:

Statistical Package for Social Science (SPSS) 26.0 software was utilized for statistical analysis. The scale scores and other measurement data were expressed as mean±standard deviation. Independent t-test was performed for comparison between groups and one-way analysis of variance and stepwise multivariate logistic regression analysis were conducted for comparison among groups. Spearman's analysis was utilized to investigate the correlations of fatigue with social support and psychological resilience. $p < 0.05$ was considered statistically significant.

RESULTS AND DISCUSSION

The FAI score of patients with recurrent ovarian cancer was (4.71±0.65) points and there were 26 cases (37.62 %) of general fatigue, 33 cases (47.14 %) of moderate fatigue, and 11 cases (15.71 %) of severe fatigue. The total social support score and scores of objective support, subjective support and utilization of social support of patients with recurrent ovarian cancer were (33.48±7.68) points, (8.71±2.82) points, (17.65±3.89) points and (6.82±1.65) points, respectively.

The scores of psychological resilience, self-improvement, tenacity and optimism of patients with recurrent ovarian cancer were (63.10±10.04) points, (2.51±0.57) points, (2.37±0.36) points and (2.29±0.25) points, respectively.

The results of univariate analysis revealed that medical expenditure mode, monthly per capita income, working status, life stress event and chronic disease were the influencing factors for social support of patients with recurrent ovarian cancer. Besides age, medical expenditure mode, monthly per capita income, life stress event and chronic disease were the factors influencing the fatigue of patients with recurrent

ovarian cancer. In addition, age, educational level, medical expenditure mode, monthly per capita income, life stress event and chronic disease were the factors affecting the psychological resilience of patients with recurrent ovarian cancer (Table 1).

The significant factors obtained by univariate analysis, i.e. medical expenditure mode, monthly per capita income, working status, life stress event and chronic disease, were taken as the independent variables and the social support score of patients with recurrent ovarian cancer was used as the dependent variable for logistic regression analysis. Additionally, logistic regression analysis was conducted with age, medical expenditure mode, monthly per capita income, life stress event and chronic disease as the independent variables and the fatigue score of patients with recurrent ovarian cancer as the dependent variable. Furthermore, age, educational level, medical expenditure mode, monthly per capita income, life stress event and chronic disease were taken as the independent variables and the psychological resilience score of patients with recurrent ovarian cancer was adopted as the dependent variable for logistic regression analysis. The results demonstrated that life stress event and monthly per capita income (0-1000 Chinese Yuan Renminbi (CNY)) were the independent risk factors affecting the social support score of patients with recurrent ovarian cancer. Besides, age (≥61 y old) and chronic disease were the independent risk factors influencing the fatigue score, and age (≥61 y old) and life stress event were the independent risk factors affecting the psychological resilience score of patients with recurrent ovarian cancer (Table 2-Table 5).

Fatigue was significantly negatively correlated with psychological resilience (r=-0.589) and social support (r=-0.694) in patients with recurrent ovarian cancer (p<0.05) (Table 6).

TABLE 1: UNIVARIATE ANALYSIS RESULTS OF INFLUENCING FACTORS FOR SOCIAL SUPPORT, FATIGUE AND PSYCHOLOGICAL RESILIENCE OF PATIENTS WITH RECURRENT OVARIAN CANCER

Demographic feature (n=70)	Social support	F/t	p	Fatigue	F/t	p	Psychological resilience	F/t	p
Age ($\bar{x}$)									
40≤$\bar{x}$≤60 (n=46)	33.54±7.31	0.51	0.61	4.21±0.65	4.5	0	60.91±8.94	2.09	0.04
$\bar{x}$>60 (n=24)	32.62±7.02			4.97±0.71			56.12±9.41		
Educational level									
Technical secondary school or above (n=21)	33.61±8.52	1.83	0.3	4.69±0.61	1.55	0.421	65.32±10.71	8.48	0
Junior high school (n=21)	33.52±7.27			4.71±0.78			60.52±10.14		
Primary school (n=10)	33.36±7.61			4.71±0.54			59.31±10.23		
Illiterate (n=18)	33.12±6.85			4.72±0.68			59.08±9.82		
Working status									
In service (n=59)	33.23±6.26	8.12	0	4.74±0.71	0.13	0.913	63.32±10.71	0.81	0.091
Retired (n=6)	33.21±5.91			4.64±0.60			62.74±9.79		
Unemployed (n=5)	34.34±6.22			4.63±0.75			62.71±9.11		
Medical expenditure mode									
Medical insurance (n=32)	32.89±8.70	7.2	0	4.31±0.74	4.28	0.038	62.29±10.82	7.88	0
At one's own expense (n=24)	36.93±6.82			4.92±0.69			65.82±8.81		
Others (n=24)	30.01±6.91			4.23±0.79			59.12±10.14		
Monthly per capita income $\bar{x}$									
$\bar{x}$≤1000 CNY (n=10)	30.72±8.02			4.94±0.69			58.38±10.37		
1001 CNY <$\bar{x}$<2000 CNY (n=10)	31.84±7.19	8.18	0	4.78±0.73	11.3	0	61.24±9.41	12.4	0
2001 CNY <$\bar{x}$<3000 CNY (n=20)	32.94±6.42			4.43±0.82			63.12±8.45		
$\bar{x}$≥3000 CNY (n=30)	35.81±7.43			4.25±0.51			66.26±8.91		
Life stress event									
No (n=45)	31.91±6.48	2.25	0.03	4.40±0.61	2.96	0.004	65.19±10.38	2.01	0.048
Yes (n=25)	35.76±7.49			4.91±0.82			60.05±9.99		
Chronic disease									
Yes (n=46)	36.92±6.43	3.02	0	4.92±0.81	3.09	0.003	60.11±10.49	2	0.049
No (n=24)	31.76±7.41			4.34±0.60			65.29±9.87		

Note: CNY: Chinese Yuan Renminbi

TABLE 2: ASSIGNMENT OF VARIABLES INCLUDED IN MULTIPLE LINEAR REGRESSION ANALYSIS

Variable	Assignment
Age	0=0-39 y old, 1=40-60 y old, 2=≥61 y old
Educational level	0=Technical secondary school or above, 1=Junior high school, 2=Primary school or illiterate
Medical expenditure mode	0=Health insurance, 1=At one's own expense or others
Monthly per capita income	0=0-1000 CNY, 1=1001-2999 CNY, 2=≥3000 CNY
Life stress event	0=Yes, 1=No
Chronic disease	0=Yes, 1=No

TABLE 3: LOGISTIC REGRESSION ANALYSIS RESULTS OF INFLUENCING FACTORS FOR FATIGUE SCORE OF PATIENTS WITH RECURRENT OVARIAN CANCER

Variable	β	SE	Wald	p	OR (95 % CI)
Age (≥61 y old)	-0.821	-0.717	0.606	0.001	2.969 (1.482-3.112)
Chronic disease	-0.712	-1.374	2.051	0.002	2.419 (1.463-6.341)

Note: β: Beta; SE: Standard error; OR: Odds ratio and CI: Confidence interval

TABLE 4: LOGISTIC REGRESSION ANALYSIS RESULTS OF INFLUENCING FACTORS FOR SOCIAL SUPPORT SCORE OF PATIENTS WITH RECURRENT OVARIAN CANCER

Variable	β	SE	Wald	p	OR (95 % CI)
Life stress event	-0.711	-4.135	0.725	0	2.286 (1.545-4.359)
Monthly per capita income (1-1000 CNY)	-0.625	-3.619	0.812	0.005	1.492 (1.315-3.438)

Note: β: Beta; SE: Standard error; OR: Odds ratio and CI: Confidence interval

TABLE 5: LOGISTIC REGRESSION ANALYSIS RESULTS OF INFLUENCING FACTORS FOR PSYCHOLOGICAL RESILIENCE SCORE OF PATIENTS WITH RECURRENT OVARIAN CANCER

Variable	β	SE	Wald	p	OR (95 % CI)
Age	-0.668	-0.743	0.992	0.006	1.650 (1.022-4.121)
Life stress event	-0.656	-1.801	0.814	0.004	1.718 (1.211-4.568)

Note: β: Beta; SE: Standard error; OR: Odds ratio and CI: Confidence interval

TABLE 6: SPEARMAN'S ANALYSIS RESULTS OF CORRELATIONS OF FATIGUE WITH SOCIAL SUPPORT AND PSYCHOLOGICAL RESILIENCE IN PATIENTS WITH RECURRENT OVARIAN CANCER

Item	Fatigue	
	r	p
Social support	-0.589	0.000
Psychological resilience	-0.694	0.000

The high mortality rate of ovarian cancer has a close association with its high recurrence rate. Patients with recurrent ovarian cancer often suffer from multiple relapses and treatment. Although their survival rate has been improved obviously, side effects will be caused regardless of the treatment method[7]. Hence, how to improve the quality of life of patients with recurrent ovarian cancer while prolonging their survival has become a topic continuously explored by gynecologists.

Currently, palliative therapies are dominated in the treatment after recurrence of ovarian cancer, and there have been no definite and acknowledged treatment regimens yet. In most cases, surgery plus chemotherapy (paclitaxel combined with cisplatin) was adopted as the first choice of treatment. However, the treatment process is long and complicated, bringing varying degrees of impact on the patients' body and mind. On the one hand, the patients have to bear the pain induced by surgery; on the other hand, they also need to face the short-term and long-term side effects produced by chemotherapy, among which cancer-related fatigue is the most common symptom, with clinical manifestations of nausea, vomiting, anxiety and pain[8]. According to a previous literature, fatigue is a condition of weakness, adynamia and functional degradation triggered by excessive physical or psychological consumption of the body[9]. Fatigue will not only break physiological and emotional balance of the body, but also result in problems such as declined thinking ability, burnout and impaired physical and mental function[10]. A previous study has shown that 65 %-100 % of the patients undergoing chemotherapy and 67 %-100 % of the patients receiving interferon have experienced fatigue and different from general fatigue that can be relieved by rest, cancer-related fatigue lasts for a long time and is more severe[11]. Another study revealed that patients with ovarian cancer have high levels of fatigue and sleep disorder, seriously influencing their quality of life[12]. In the present study, the FAI score of patients with recurrent ovarian cancer was (4.71±0.65) points, indicating general fatigue and moderate fatigue. The results of logistic multivariate regression analysis manifested that age (the higher the age, the severer the fatigue), chronic disease (patients with chronic diseases such as coronary heart disease, diabetes and hypertension feel more tired), monthly medical expenditures (the more they spend on medical expenditures, the more tired they feel) and self-care (they feel more tired when taking care of themselves alone without other families' help) were the major factors influencing fatigue. Physical fatigue increases with the increase of the patients' age.

Moreover, chronic disease will also make patients feel weak and more tired, coupled with long term high medical expenditures. As a result, patients are prone to fatigue.

According to the research by the Chinese Academy of Social Sciences, patients' social support can not only elevate the psychological satisfaction of the body, but also relieve the negative emotions and "family", "clan" and "personal network" are the top three sources of social support[13]. Due to the long treatment process of recurrent ovarian cancer, it is difficult for the patients without a certain economic basis to maintain the therapy. In this study, it was found through multivariate analysis that life stress event and monthly per capita income were the factors affecting social support of patients with recurrent ovarian cancer.

Psychological resilience refers to the cognition, potential and psychological characteristics stimulated by the body in the face of difficulties. It is a process of active adjusting and coping with internal and external resources and also a process towards a positive goal[14]. In this study, the psychological resilience score of patients with recurrent ovarian cancer was (63.10±10.04) points, which was low in general. The results of multivariate logistic regression analysis demonstrated that age (≥61 y old) and life stress event were the major factors affecting psychological resilience. Due to long term chemotherapy, long term medical reexamination, high medical expenditures and psychological, family and social pressure, patients with recurrent ovarian cancer often experience bad emotions such as anxiety and depression. Moreover, deficiency of role in the family and society and declined self-care ability also seriously reduce the level of psychological resilience of patients with recurrent ovarian cancer.

In this study, the Spearman's analysis was utilized to investigate the correlations of fatigue with social support and psychological resilience of patients with recurrent ovarian cancer and it was found that fatigue had a significant negative correlation with social support and psychological resilience of patients with recurrent ovarian cancer. The social support of patients with ovarian cancer was low in this study, probably because the medical insurance system is not perfect and there are many inadequacies in nursing details, resulting in less social support for the patients. Meanwhile, due to problems such as treatment side effects and social discrimination, the patients have little communication with others, thus greatly reducing the utilization of social support. It has been reported that

there is a correlation between the level of psychological resilience and the coping style of cancer patients[15]. This suggests that ovarian cancer patients should be guided to adopt a positive "optimistic" coping style during clinical nursing, so as to relieve their fatigue and boost their psychological resilience level. At present, foreign studies have more in-depth research on the level of psychological resilience and the research methods are diverse, which is worth learning. In China, current research on psychological resilience is still at an initial stage, with limited research population and a single method. In the future, it is necessary to further strengthen the in-depth study on the psychological resilience of clinical patients and caregivers.

To sum up, recurrent ovarian cancer will not only bring physical, psychological and social stress problems to patients, but also burden their families heavily. Physical and mental health of patients with recurrent ovarian cancer is the foundation of improving their quality of life. Hence, in clinical treatment, attention should be paid to the patients' psychological changes and needs, the psychological factors of patients with recurrent ovarian cancer should be fully considered and targeted psychological and behavioral intervention should be given. Furthermore, the patients should be provided with sufficient social support, so as to improve their physical and mental health, thus finally elevating their quality of life in an all-round way.

Conflict of interests:

The authors declared no conflict of interest.

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