Depression, Mood State, Fatigue, and Quality of life in Cancer Patients

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Abstract : Background/Objectives: This study was conducted to investigate the effect of depression, mood state, and fatigue and quality of life in cancer patients. Methods/Statistical analysis: Data collection of this study was conducted from September 2017 to January 2018, data were collected from 140 cancer patients at three higher-grade general hospitals in Seoul. The collected data were analyzed using SPSS ver. 20.0 (SPSS Inc., Chicago, IL, USA). Findings: The subjects were 93 males (66.4%) and 47 females (33.6%) and the mean age was 55.26 (±11.32). The mean and standard deviation of each variable are as follows. Depression was 3.1 (±1.05), mood state was 1.49 (±.42), fatigue was 2.34 (±.80) and quality of life was 3.32 (± .53). Depression (r = -.601, p <.01), mood state (4.83, P < .01) and fatigue (-453, p <.01) were significantly correlated with quality of life. The results of multiple regression analysis to examine the effects of quality of life are on cancer patient's depression, mood state, and fatigue. The lower the depression (B= -.260, p<.001), the more increase mood state (B= .458, p= 003), the less Fatigue (B=--.359, p= 006), it was found that quality of life increased. Improvements/Applications: This study has significant implications for providing basic data on depression, mood, and fatigue to improve the quality of cancer patients, and requires more active nursing intervention based on data.

Keywords: Cancer, Mood state, depression, Quality of life, Fatigue.

I. INTRODUCTION

Cancer is one of the most important health problems in Korea, accounting for 28.3% of all deaths. The National Cancer Center analyzes the deaths of the Korea Central Cancer Registry and the National Statistical Office and reports cancer statistics in Korea each year. According to the 2013 cancer patient analysis released in 2016, a total of 225,343 cancer patients will develop during the year 2013, and the likelihood of developing cancer in a lifetime is 36.6%. Thyroid cancer was the most common cancer type, followed by gastric cancer, colon cancer, lung cancer, and breast cancer [1]. In the meantime, 95% of patients with gastrointestinal cancer experience depression only by the diagnosis of cancer itself [2], and depression is reported to be further exacerbated by physical side effects such as surgery or chemotherapy [3]. Mood can provide specific directions from positive emotions to the most negative emotions with strong emotions that occur temporarily, accompanied by physical changes, and induce behavior and exchange emotions. [4]. In previous studies, patients with primary brain tumors reported depression and anxiety due to negative thoughts on fear and uncertain outcome from initial treatment, and reported that such mood states may be associated with fatigue and adversely affect treatment [5]. Therefore, it is important to understand the mood status of cancer patients in order to understand cancer patients and provide appropriate nursing interventions. .However quality of life in cancer patient is severely negatively influenced by mental, social, and psychological problems such as depression, self-loss, and others. To develop the interventions needed for cancer patients, it is necessary to identify the extent and nature of the symptoms experienced by the patients during the course of the disease, and to ascertain the extent and nature of these symptoms on the quality of life. Quality of life refers to the subjective well-being of individuals in the physical, mental, social, economic, and spiritual domains. It has been reported that the overall quality of life of cancer patients is diminished due to the side effects and sequelae associated with aggressive treatment to prolong survival [6]. Cancer patients facing life-threatening illnesses may experience depression and anxiety from initial treatment with negative thoughts on fear and uncertain outcome, and this mood state is associated with fatigue [4, 5]. Fatigue is a subjective feeling different from tired and appears gradually. Also, unlike fatigue, tired can be reduce by the rest period. Fatigue can have a physical or mental causes.[7] Curt et al. found that 91% of cancer patients were disturbed by fatigue and 88% of them were affected by fatigue [8]. When health people experience fatigue, they recover from fatigue easily by sleeping and resting. However, cancer patients are more likely to experience fatigue due to poor health caused by the illness itself and the accumulation of infections, fever, toxic metabolites, emotional problems, and chemotherapy drug side effects [9].

In Oh and Lim's study of colorectal cancer and stomach cancer patients, cancer symptoms and depression, the most severe symptoms were immediately after the termination of the medication, and most of them recovered after 6 months. However, it was concluded that depression was the most important factor for the quality of life [10]. In addition, Hwang and Park, who studied primary brain tumor patients, found that the mood state was a significant contributor to fatigue in cancer patients. [11]. Lee, Byun, and Kim, who studied breast cancer patients, reported a significant negative correlation between mood and quality of life [12]. This study aims to provide basic data for the development of nursing intervention to improve the quality of life of cancer patients by checking the relationship between depression, mood state, fatigue and quality of life of cancer patients.

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Therefore, it would be meaningful to examine the effects of depression, mood, and fatigue on the quality of life of cancer patients. The specific objectives for this are as follows.

1. Understand depression, mood state, fatigue, and quality of life in cancer patients.
2. Analyze the correlation between cancer patients' depression, mood state, fatigue, and quality of life.
3. Identify the effects of cancer patients' depression, mood state and fatigue on quality of life.

II. MATERIALS AND METHODS

2.1. *Ethical-consideration*

This study was approved by the Institutional Review Board at a University Hospital (IRB No., *** 12080046), and it was conducted in accordance with the principles of the Helsinki declaration. All the information gathered was treated confidentially and anonymously. All participants were provided an explanation about this data: that it would never be used for any purpose other than this research. Informed consent was obtained when the participants agreed to participate in this study, and this was duly obtained.

2.2. *Research tools*

2.1.1. Depression cognitive scale

Depressive cognitive scale consisted of a total of 8 items and a 5-point Likert scale. The lower score indicate a higher depressive level. This instrument was measured by the Korean version of the depressive cognition scale (K-DCS) developed by Zausziewski [13] and developed in Korean by Yeun, Kown and Kim [14]. Cronbach's alpha was .918 in the original instrument and .922 in the present study.

2.1.2. K-POMS-Brief

The mood state was a tool developed by Yeun and Shin-Park as a Korean-style tool [15]. The total score range is from 0 to 120 points. The higher the score, the more severe the mood disorder. The Cronbach's alpha of the original instrument was .919 and was .833 in this study.

2.1.3. Fatigue scale

In reviewing the literature, the cancer patient's fatigue tools were used with the assistance of a nurse to conduct individual in-depth interviews with each patient to obtain statements about fatigue and then to use the final 40 statement tools. It consists of a total of 40 questions, 5 points, and the higher the score, the more fatigue. In the original study, Cronbach's alpha was .914, and in this study, it was found to be .943.

2.1.4. Quality of life

The quality of life scale (WHOQOL-BRIF), which was standardized by Min et al.'s, a simplified version of the World Health Organization Quality of Life Assessment (WHOQOL) [16]. The Korean version of WHOQOL-BRIF consists of 26 items. There are two overall quality of life and general health domains (Cronbach's α = .65), seven physical domains (Cronbach's α = .75), six psychological domains (Cronbach's α = .79), three social domains (Cronbach's α = .67), and eight environmental domains (Cronbach's α = .84. In this study, Cronbach's α was .92.

2.3. *Selection of research subjects, data collection and analysis.*

The study was conducted on 140 people who agreed to the study as cancer patients who were hospitalized at a higher general hospital in Seoul. The research period was from September 1, 2017 to January 25, 2018. A total of 150 copies were carried out, and 140 copies were used, excluding 10 insufficient data. The collected data were analyzed by frequency and percentage, mean and standard deviation, Pearson's correlation coefficient, and multiple regression.

III. RESULTS AND DISCUSSION

Table 1 shows the general characteristics. The subjects were 93 males (66.4%) and 47 females (33.6%) and the mean age was 55.26 (±11.32). The mean and standard deviation of each variable are as follows. Depression was 3.2 (±1.05), mood state was 3.6 (±1.49), fatigue was 3.3 (±1.93) and quality of life was 3.3 (± .53). The number of people living alone stood at 10 (7.1 %), and that of those living alone without spouses (12.1 %). In education, 54 (38.6 %) graduated from high school or higher, and 46 (32.9 %) graduated from college or higher.

The number of subjects with jobs was 84 (60.0%) and 55 without religion (39.3%) and the monthly income was as follows. The figure stood at 20 % below 1 million won, 24.3 % from 10.1 million won to 2 million won, 20 percent from 20.1 million won to 3 million won, and 19.3 % from 4 million won or more. The number of primary caregivers was 103 (73.6 %), and 82 (58.6 %) had cancer insurance. Pain was experienced by 24 people (17.1 %). They replied that the degree of fatigue felt by the subject was an average of 97.73 (±21.10), Subjects responded that the patients themselves paid for the treatment, 36 (25.7 %) said the spouse pays for the treatment, and 12 (8.6 %) answered that their children or relatives pay for the treatment. Verification of differences between general characteristics and each variable is as follows. General characteristics with significant statistical differences from depression are as follows. Job (t=-2.462, p=015), A treatment fee holder (F=3.165, p=.43), and main carrier (F=2.934, p=.04). General characteristics with significant statistical differences from mood state are as follows. Main caregiver (F=3.053, p=.031), whether cancer insurance (t=-2.4546, p=.015) and pain experience (F=-2.399, p=042). General characteristics with significant statistical differences in quality of life are marital status (F=3.831, p=.004), Job (t=-3.319, P=.022), Main Caregiver (F=3.053, p=.031), and pain experience (F=-2.066, p=035) appears. Table 2 shows each variable's possible range, lowest and highest points, the mean and standard deviation of the total score, and the mean and standard deviation by the Likert scale. The fatigue average and standard deviation of the subjects were 23.73 (±25.79), when asked to rate the fatigue of the subjects from 1 to 100. The quality of life asked in the same way was found to be 42.02 (±33.93).

TABLE 1. General characteristics and differences with general characteristics. (N=140)

Variables		N (%) M(SD)*	Depression			K-POMS-B			QOL			Fatigue		
			M±SD	t/F	*p*	M±SD	t/F	*p*	M±SD	t/F	*p*	M±SD	t/F	*p*
Age	55.26(11.32)		3.2±1.05			3.6±1.49			3.3±. 53			2.34±.80		
Gender	male	93(66.4)	3.12±1.02	-902	.369	1.50 b42	.385	.138	3.81±.65	-.1300	196	3.22±.68	-.458	.648
	female	47(33.6)	3.29±1.10			1.47 b41			3.40±.57			3.29±.66		
Spouse status	single	10(7.1)	2.74±.87			1.69±.65			2.86±.38[b]			3.38±.71		
	marriage	113(80.7)	3.25±1.06	1.322	.270	1.45±.37	2.412	.093	3.78±.54[a]	**3.831**	**.004**	3.25±.66	.967	.383
	Without spouse	17 (12.1)	3.03±1.01			1.62±.54			3.02±.46[b]		**a>b**	3.10±.67		
Educational status	Below middle school	39(11.0)	3.04±1.25			1.55±.28			3.26±.45			3.34±.53		
	High school	54(38.6)	3.38±,91	1.475	.232	1.47±.44	.533	.588	3.32±.47	.330	.720	3.21±.76	.637	.539
	Above university	46(32.9)	3.09±.99			1.47±.50			3.36±.65			3.24±.67		
Job	Yes	84(60.0)	3.36±.96	**-2.462**	**.015**	1.47±.46	.752	.138	3.40±.54	**-3.313**	**.022**	2.03±.61	**3.162**	**.022**
	No	56(40.0)	2.92±1.12			1.52±.35			2.19±.49			3.16±.62		
Religion	No	55(39.3)	3.13±.99			1.50±.39			3.29±.48			3.19±.73		
	Christian	30(21.4)	3.18±1.20	.209	.890	1.43±.48	.875	.382	3.34±.58	.255	.858	2.79±.43	1.152	.052
	catholic	14(10.0)	3.10±1.13			1.41±.21			3.42±.62			3.21±.50		
	Buddhism	41(29.3)	3.30±.99			1.55±.48			3.30±.52			3.39±.74		
Monthly average income	Less than 100	28(20.0)	3.09±1.32[b]			1.51±.37			2..21±.56			3.38±.69[b]		
	101~200	34(24.3)	3.03±.93[a]	.495	.780	1.57±.36	1.796	.118	2.56±.36			2.95±.55[ba]		
	201~300	21(15.0)	3.14±1.07[a]			1.66±.48			2,32±.54	3.656		3.28±.80[b]	**3.589**	**.002**
	301~400	28(20.0)	3.29±.96			1.38±.51			2.11±.46			3.00±.47[b]		**a<b**
	More than 401	27(19.3)	3.30±.1.05			1.36±.36			3.49±.68			2.10±.73[a]		
A treatment fee holder	Him or herself	92(65.7)	2.05±.41[a]			1.50±.46			3.26±.52			2.95±.61		.
	Spouse	36(25.7)	3.54±.99[c]	**3.165**	**.043**	1.46±.31	.244	.783	3.40±.54	1.364	.259	3.40±.67	.801	.451
	Parents Son& daughter others	12(8.6)	3.11±.45[b]		**b>c>a**	1.55±.41			3.46±.54		.	3.21±.69		.
Main caregiver	Spouse	103(73.6)	3.58±1.04[a]			1.83±.36[a]			3.36±.52			2.94±.58[a]		
	parents	10(7.1)	3.02±.81[b]			1.60±.59[b]			3.36±.60			3.09±.67[b]		
	Child	19(13.6)	3.03±1.14[b]	**2.934**	**.04 a>c**	1.59±.53[b]	**3.053**	**.031**	3.20±.46	2.105	.103	3.19±.55 [b]	**3.195**	**.026.**
	Etc	8(5.7)	2.11±.79[c]			1.32±.54[c]		a<b<c	2.93±.56			3.57±.99[b]		a<b<c
Whether cancer insurance	Yes	82(58.6)	3.19±1.09	.126	.900	1.42±.36	**-2.456**	**.015**	3.37±.52	1.463	.146	2.09±.67	**3.284**	**.024**
	No	58(41.4)	3.17±.99			1.53±.48			3.24±.53			3.09±.65		
Pain experience (1~100)	Yes	115(82.9)	3.19±1.05	.439	.661	1.46±.39	**-2.399**	**.042**	3.33±.54	**-2.066**	**.035**	3.69±.55	**-12.154**	**.000**
	No	24(17.1)	3.09±.99			2.48±.54			2.28±49			2.05±.50		
Feelings of fatigue	(1~100)	23.73(25.79)	23.73±25.79											
Overall quality of life	(1~100)	42.02(33.93)	42.02±33.93											

K-POMS-B; Korean version of Profile of Mood States-Brief

TABLE 2. Descriptive of Depression, K-POM-B, Fatigue and Quality of life

Variables	Possible range	The lowest point -The highest point	Total M±SD	
Depression	0-40	0-40	25.53 ± 8.37	3.1±1.05
K-POM-B (Mood status)	0-120	21-103	43.50 ± 12.02	1.49±.42

Fatigue	40-200	40-167	97.37 ± 21.10	2.34±.80
Quality of Life	26-130	60-129	86.09 ± 13.71	3.32±.53

The correlation between quality of life and each variable is as follows (Table 3). There was a significant negative correlation between fatigue (r = -. 453, P<.001), and a significant positive correlation with mood status (r = .483, P <.001). There was also a significant negative correlation with depression (r = -.601, p <.01). On the other hand, there was a significant negative correlation between fatigue and mood state (r = -.591, p <.001). Also there was a positive correlation between fatigue and depression (r= .194, p<.001). Mood state and depression were negatively correlated (r = -.233, p<.01). (Table 3)

TABLE 3. Correlations among Depression, K-POM-B, Quality of life and Fatigue (N=140)

Variables	Depression	K-POM-B (Mood state)	Quality of Life	Fatigue
Depression	1		.	
K-POM-B (Mood status)	-.233**	1		
Quality of Life	-.601**	.483**	1	
Fatigue	.194*	-.591**	-.453**	1

* <.05 ** <.01 *** <.00

Table 4 summarizes the results of multiple regression analysis to examine the effects of quality of life on cancer patient's depression, mood state, and fatigue. The lower the depression (B= -.260, p<.001), the more increase mood state (B= .458, p= 003), the less Fatigue (B=--.359, p= 006), it was found that quality of life increased.

TABLE 4. Multiple regression of depression, K-POMS-B, Fatigue and quality of life (N=140)

Predictors	Quality of life						
	B	Standard error	β	t	*p*	tolerance	VIF
Constant	3.151	.190		16.557	.000		
depression	-.260	.032	.516	8.158	.000	.974	1.016
K-POMS-B	.458	.080	.366	5.710	.003	.987	1.014
Fatigue	-.359	.079	-.378	4.135	.006	.960	1.010

K-POMS-B; Korean version of Profile of Mood States-Brief

The study attempted to identify the relationship between depression, mood state, fatigue and quality of life for cancer patients and to identify the effects of quality of life on depression, mood state and fatigue. I would like to discuss the above results. There was a significant difference between depression and job (t=-2.462, p=.015). The depression of those who did not have a job was more depressing than that of those who had a job. Similar results were reported in a study by Suh [17] which studied the quality of life for breast cancer patients. Having a job is thought to be less depressing than those who do not have an income to pay for cancer treatment with a fixed income. In this study, depression was statistically significant, depending on the primary caregiver, and if the primary caregiver was a spouse, it was significantly less depressing than those of the patient's parents, children, or others. Kang and Suh's study [18], which showed similar results, reported that high support from his spouse would satisfy the emotional area and increase resilience. It is believed that increased resilience is indirectly equivalent to less depression. The mood stats also showed a significant statistical difference between main caregiver, which was the same as depression and main caregiver. Also, the mood state of the subjects with pain was significantly lower than that of subjects without pain (t=-2.399, p=.042). Pain is a common problem for cancer survivors, especially during the first few years of treatment. In the long term, about 5% to 10% of survivors suffer chronic severe pain, which disrupts their function [19]. Patients diagnosed with cancer experienced many signs and symptoms in the course of cancer treatment and disease development. As 52% of cancer patients complain of pain, and as cancer progresses, the rate of suffering for advanced cancer patients reaches 64 %. Among them, 43 % report that pain control is insufficient and half of the late cancer patients who are hospitalized at a hospice palliative care institution are suffering from more than severe pain when they are hospitalized [20]. Thus, according to the preceding study, the results of this study that pain makes the mood of cancer patients to worse is a natural result.

The quality of life in this study showed statistically significant correlation with depression (r = -.601, p <.01), mood state (r = .483, P <.001) and fatigue (r = -. 453, P<.001). Additionally The lower the depression (B= -.260, p<.001), the more increase mood state (B= .458, p= 003), the less Fatigue (B=--.359, p= 006), it was found that quality of life increased. In Lee et al's study [21], the depression of elderly patients undergoing chemotherapy is a significant negative correlation to the quality of life (r=-.33, p<.001) reported. In addition, studies such as Tigari et al found that the mood state of breast cancer patients with mastectomy had a reverse relationship to health,

psychology, socio-economic quality of life and had a negative effect on the quality of life [22]. Therefore, it is necessary for cancer patients to improve their quality of life by providing support for and intervention in nursing. In a study on the fatigue and quality of life of a cancer patient hospitalized, the level of fatigue and quality of life of the subject were reported to have a significant reverse correlation [23], showing similar results to this study. It also reports that most cancer patients receiving chemotherapy experience fatigue, most of the symptoms experienced by cancer patients are the most unpleasant and painful side effects and have a chronically lasting characteristic that is not easily mitigated by rest [24]. Therefore, there is a need for active nursing interventions on depression, mood state and fatigue that affect the quality of a cancer patient's life.

However, because this study did not distinguish characteristics by cancer patient and did not control the duration of treatment or the type of chemotherapy, there are limitations in interpreting the findings.

IV. CONCLUSION

The purpose of this study was to investigate the relationship between depression, mood state, fatigue, and quality of life and to investigate the effects of quality of life on depression, mood state, and fatigue in in cancer patients**.** In this study, quality of life and depression showed statistically significant negative correlation, significant amount of correlation with mood status, and significant negative correlation with fatigue. Also the results of multiple regression analysis to examine the effects of quality of life are on cancer patient's depression, mood state, and fatigue. The lower the depression, the more increase mood state, the less fatigue, it was found that quality of life increased. However, since this study was conducted only for cancer patients in some areas, repeated research on cancer patients with various characteristics of various areas should be conducted for the generalization of research.

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