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Determinants of Fatigue, Self-efficacy, and Quality of Life of Cancer Patients During Chemotherapy: A Study from Turkey

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Abstract

Patients with cancer feel too much anxiety, loss of control, helplessness, severe emotional distress, symptom burden and struggle to adapt with diagnosis and treatment. Beliefs and perceptions about own capabilities influence patients' self-control over functioning. The objective of the study was to explore the personal, disease and treatment-related characteristics with fatigue, self-efficacy, and quality of life of cancer patients during chemotherapy. This is a descriptive-correlational research. The study sample composed of 236 patients treated with breast, lung, colorectal or stomach cancers. The patients were recruited from an outpatient chemotherapy unit of a state hospital. Data was collected using Patient Information Form, Functional Assessment of Chronic Illness Therapy-Fatigue and Strategies Used by Patients to Promote Health scales. Mean age of the patients was 57.37 years. The sample was made of mostly lung cancer (30.9%). The cancer stage and presence of distant metastasis were the determinants of fatigue for cancer patients. Females, patients with low income, poor functional status, and advanced cancer stage, the history of cancer treatments had worse quality of life scores. The patients' functional status, cancer stage, the history of cancer treatments and marital status were the determinants of self-efficacy. The results displayed that some personal and clinical variables influenced the self-confidence in performing self-care behaviors, fatigue and the quality of life. Patients with the history of radiotherapy or surgery and advanced cancer needed to be supported for developing their self-confidence, fatigue management and improving functional status, and quality of life.

1. Introduction

Chronic diseases such as cancer are an important source of stress on people and their families. Both cancer diagnosis and cancer treatments impair the functional status, well-being, and social functioning. Many psychosocial factors influence the adaptation with the illness such as social support, personality, sociodemographic characteristics, and perceived control and beliefs [1]. Patients with cancer feel too much anxiety, loss of control, helplessness, severe emotional distress, symptom burden and struggle to adapt with diagnosis and treatment [1], [2]. Beliefs and perceptions about own capabilities influence patients' self-control over functioning [3]. Self-efficacy perceptions enhance

screening behaviors for the early detection of cancer [3] and help cancer patients engage in coping with burden and stress of the disease [4]. Self-beliefs affect personal growth, coping strategies, adaptation to cancer and treatment and survivorship [4], [5] and self-efficacy has been also found as a predictor of physical activity [6]. Self-efficacy in cancer patients has been linked with good emotional adjustment [7].

Fatigue is the most common symptom-causing distress for cancer patients [8], [9]. There are many factors that cause fatigue such as direct effects of cancer, psychosocial factors, and cancer treatments. Fatigue interferes the usual functions, influences the quality of life and psychosocial functioning [10]. One study found that cancer patients were less confidence in managing fatigue [11]. Fatigue has been linked to the depression, anxiety and sleep disturbances, coping styles, demographic and medical factors [8], [12].

Illness burden and health care costs in chronic conditions are expected to increase in all over the world. Patients with chronic disease need to deal with burden of symptoms, treatment, physical and social consequences, rehospitalizations and lifestyle changes. Promoting patient participation, self-efficacy and education will help patients manage with chronic conditions [13]. A study (Gallagher et al. 2008) found that the self-management with chronic illness was poorer in elderly people [14].

Self-efficacy is considered as one of the major components for successful self-management in chronic diseases [14]. Social Cognitive Theory labels the individual's confidence or belief in own ability to succeed at chosen tasks; to achieve set goals as "self-efficacy" [15]. Self-efficacy influences health status and health care utilization [16]. In order to manage with chronic illness effectively, the people need to participate actively with their health care and healthy lifestyle choices. Individual's confidence or belief in their capacity is prerequisite for performing is task and it influences the maintenance of healthy behaviours [14].

The quality of life and psychosocial factors are considered as a predictor of survival in cancer. Assessment of factors that influence the well-being and self-care behaviors, may lead to better symptom management. Self-efficacy has been reported to facilitate health behaviors and promote healthy outcomes. Self-efficacy in prostate cancer patients has been linked with good emotional adjustment [7]. Studies aiming to explore the relationship between self-efficacy and psychosocial factors, and other personal characteristics will help tailor more effective management strategies based on patients needs.

2. Aim of the Study

It was carried out to explore the personal-, disease- and treatment-related patients related characteristics with fatigue, self-efficacy, and quality of life of cancer patients during chemotherapy.

3. Materials and Methods

3.1. Study Design

This study is a descriptive-correlational research.

3.2. Setting

The patients were recruited from an outpatient chemotherapy unit of a state hospital.

3.3. Study Sample

The study sample composed of 236 patients treated with breast, lung, colorectal or stomach cancers. Inclusion criteria for the study participants were as follows: undergoing chemotherapy with the cancer diagnosis, 18 years of age or older, giving a written consent for participating in the study, Turkish-speaking and being literate and being at the good health condition to participate in the study. The sample was recruited using a convenience sampling method.

3.4. Ethical Considerations and Data Collection

The study was approved by an ethical committee. The hospital administration gave a permission to conduct the study. The written permission was obtained for using the scales. The aim of the study was explained and the patients gave a written consent. Data was collected using questionnaires.

3.5. Instruments

Patient Information Form included questions about sociodemographic characteristics, cancer diagnosis, and treatment–related characteristics. Patients' performance status was assessed using the Eastern Cooperative Oncology Group scale. Data about patients' personal and clinical characteristics from medical records.

Functional Assessment of Chronic Illness Therapy-Fatigue ([FACIT-F]–4th Version) scale is a 40th-item health-related quality of life tool. FACIT-F is used to assess the cancer patients' quality of life and fatigue. It is a five-point Likert-type scale ranging from 0 (not at all) to 4 (very much). FACIT-F is made of five subscales; Physical well-being, Social/Family well-being, Emotional well-being, Functional well-being and Fatigue subscale, respectively. The total score of FACIT-F ranges between 0-160. The higher score indicates better quality of life [17]. Cronbach's alpha coefficient in the current study was 0.976 for the total scale.

Strategies Used by Patients to Promote Health (SUPPH) scale measures the patient's confidence in performing self-care self-efficacy of individuals for health promotion strategies or behaviors. It was developed by Lev and Owen (1996). The SUPPH is a self-report scale with 29 items. The scale is a 5-point rating scale ranging from "very little confidence" to "quite a lot of confidence". The SUPPH was used in cancer patients receiving chemotherapy, with end-

stage renal disease and patients with bone marrow transplantation. The scale was made of three subscales: Stress Reduction, Making Decisions and Positive Attitude subscales. Minimum score to be obtained is 29; the maximum score is 145 points. The higher scores indicate more positive perceptions of perceived self-care self-efficacy [18], [19], [20], [21], [22], [23]. Cronbach's alpha coefficient of total scale in the current study was 0.985.

4. Statistical Analysis

Data were analyzed using SPSS 16.0 (Statistical Program for Social Sciences) program. Descriptive statistics were used to calculate the data. Means of subscales were compared with personal-, disease- and treatment-related characteristics. Parametric tests were used when the data fit the normal distribution (independent samples t-test, One-Way ANOVA). Nonparametric tests were used for comparison of scale scores with personal characteristics (Mann-Whitney U test and Kruskal-Wallis test). The statistical relationship between continuous variables and scale scores were analyzed using Pearson's correlation test. A p-value < 0.05 was used for statistical significance. Internal consistency of FACT and SUPPH scales was assessed by computing Cronbach's alpha coefficient.

5. Results

5.1. Personal Characteristics of the Study Sample

Mean age of the study sample was 57.37 (SD, 12.56) years. Patients were mostly married (83.5%). The sample was made of mostly lung cancer (30.9%). Patients were diagnosed with stage II (40.7%) and stage III cancer (37.7%). Nearly quarter of the sample (24.2%) were receiving paclitaxel.

5.2. Comparison of Fatigue Scores with Patients' Personal-, Disease, and Treatment-Related Characteristics

Parametric and nonparametric tests did not reveal any statistically significant differences between fatigue scores with respect to patient's sociodemographic characteristics ($p > 0.05$).

The means of Fatigue subscale scores were compared with respect to the presence of cancer metastasis. Fatigue subscale scores of patients with local cancer or loco-regional metastasis were higher than patients with distant-organ metastasis. The means of Fatigue subscale score were compared with respect to the stage of cancer. The scores of patients with cancer stage III and IV were higher than patients with cancer stage I or II. The patients with cancer stage III or IV felt higher fatigue (Table 1).

The current study found that the patients who underwent radiotherapy had lower Fatigue subscale scores in comparison to the cancer patients who did not undergo radiotherapy. However, the comparison of other cancer and treatment-related variables with Fatigue subscale scores did not reveal any statistically significant differences ($p > 0.05$) (Table 1). Fatigue scale score also did not correlate with age, the number of chemotherapy cycles, and duration of cancer diagnosis and time since chemotherapy ($p < 0.05$).

Table 1. *Comparison of FACIT-F Fatigue subscale means with patients' disease- and treatment-related characteristics.*

Variable		Fatigue subscale
		Mean
Cancer	Lung (n = 73)	21.99
	Colorectal (n = 61)	24.26
	Breast (n = 60)	23.78
	Stomach (n = 42)	23.21
		p = 0.76
Time since cancer diagnosis	≤ 12 months (n = 129)	22.74
	≥ 13 months (n = 107)	23.87
		p = 0.50‡
Presence of metastasis	Local (n = 71)[a]	26.14
	Loco-regional (n = 54)[b]	27.06
	Metastatic (n = 85)[c]	16.78
		p = 0.000*, a,b>c
Stage of cancer	I (n = 10)[a]	30.80
	II (n = 96)[b]	28.94
	III (n = 89)[c]	21.20
	IV (n = 41)[d]	12.54
		p = 0.000*,† a,b>c>d
ECOG- PRS	0 (n = 27)[a]	38.70
	1 (n = 113)[b]	27.98
	2 (n = 58)[c]	17.16
	3+4 (n = 38)[d]	7.50
		p = 0.000*,† a>b>c>d
History of cancer surgery	Yes (n = 102)	24.59
	No (n = 134)	22.23
		p = 0.18‡
History of radiotherapy	Yes (n = 50)	19.22
	No (n = 186)	24.33
		p = 0.034*,‡
Cycles of chemotherapy	≤6 (n =117)	24.01
	≥7 (n =108)	22.51
		p = 0.38‡
Chemotherapy agents	Platin based (n = 83)	23.80
	Non-platin based (n = 153)	22.95
		p = 0.63‡
Time since beginning of chemotherapy	0-3 months (n = 95)	22.16
	4-6 months (n = 75)	22.05
	≥ 7 months (n = 66)	26.18
		p = 0.09

‡ = t-test; = One Way ANOVA test; † = Kruskal-Wallis H test *p < 0.05, p values are presented for t-test and One Way ANOVA test and Kruskal-Wallis H test. ECOG- PRS: Eastern Cooperative Oncology Group Performance Status Ratings (PSR); 0: normal activity; 1 Some symptoms, but no bedrest during daytime; 2 Less than 50% daytime in bed; 3: More than 50% daytime in bed, Some symptoms, but no bedrest during daytime 4: Unable to get out of bed.

5.3. Comparison of Self-efficacy Scores with Personal-, Disease- and Treatment-Related Characteristics

Married cancer patients obtained lower scores from Stress

Reduction and Positive Attitude subscales and total scale score than unmarried cancer patients. The current study did not find any statistically significant differences between self-efficacy score with respect to gender, age group, education level and perceived financial status ($p > 0.05$) (Table 2).

Table 2. *Comparison of SUPPH scale means with patients' personal characteristics.*

		Stress Reduction	Making Decisions	Positive Attitude	SUPPH total scale
		mean	mean	mean	mean
Gender	Female (n = 103)	22.60	6.06	36.61	65.27
	Male (n = 133)	22.56	5.64	35.94	64.14
		p = 0.97‡	p = 0.29‡	p = 0.77‡	p = 0.77‡
Age group	≤50 (n = 60)	19.97	5.48	31.53	56.98
	51-60 (n = 76)	23.83	5.91	38.42	68.16
	≥61 (n = 100)	23.19	5.96	37.39	66.54
		p = 0.07	p = 0.58	p = 0.06	p = 0.07
Marital status	Married (n = 197)	21.78	5.67	34.89	62.34
	Not married (n = 39)	26.59	6.72	43.03	76.23
		p = 0.026*,‡	p = 0.10‡	p = 0.027*,‡	p = 0.023*,‡
Perceived income level	Poor (n = 72)	22.13	6.03	34.56	62.71
	Moderate (n = 111)	23.13	5.77	37.73	66.63
	Good (n = 53)	22.04	5.64	35.38	63.06
		p = 0.75	p = 0.75	p = 0.46	p = 0.62
Employment during illness	Currently working (n = 23)	26.17	6.78	42.09	75.04
	Not working due to cancer (n = 106)	21.75	5.88	35.17	62.79
	Not working due to other reasons (n = 107)	22.63	5.56	36.03	64.22
		p = 0.21†	p = 0.22†	p = 0.28†	p = 0.25†

‡ = t-test; = One Way ANOVA test; † = Kruskal-Wallis H test *p <0.05, p values are presented for t-test and One Way ANOVA test and Kruskal-Wallis H test.

There were not any statistically significant differences between self-efficacy scores with respect to the type of cancer, duration of diagnosis, chemotherapy protocol and duration of chemotherapy ($p > 0.05$) (Table 3). SUPPH scale scores did not correlate with age, the number of chemotherapy cycles, the length of time since cancer diagnosis and time since chemotherapy ($p < 0.05$).

Patients who underwent radiotherapy had lower self-efficacy scores from each dimension and total scale in comparison to the patients who did not undergo radiotherapy. Patients who previously undergone a cancer surgery had higher Making Decisions subscale scores than those who did not undergo any surgical procedures (Table 3).

The means of SUPPH scale score were compared with respect to the presence of metastasis. SUPPH scale scores of patients with distant-organ metastasis were lower than patients with local cancer or loco-regional metastasis. Self-efficacy was worse in patients with cancer stage III or IV than patients with cancer stage I or II. The patients with worse ECOG score obtained lower SUPPH scale scores than those with better functional status (Table 3).

Table 3. *Comparison of SUPPH scale means with patients' disease- and treatment-related characteristics.*

		Stress Reduction	Making Decisions	Positive Attitude	SUPPH total scale
		mean	mean	mean	mean
Cancer	Lung (n = 73)	21.94	5.68	35.25	62.88
	Colorectal (n = 61)	23.43	5.54	37.59	66.56
	Breast (n = 60)	23.35	6.25	37.87	67.47
	Stomach (n = 42)	21.33	5.86	33.64	60.83
		p = 0.66	p = 0.58	p = 0.58	p = 0.63
Time since cancer diagnosis	≤12 months (n = 129)	22.37	5.85	35.32	63.53
	≥13 months (n = 107)	22.82	5.79	37.34	65.95
		p = 0.74‡	p = 0.90‡	p = 0.39‡	p = 0.54‡
Presence of metastasis	Local (n = 71)[a]	26.49	7.45	43.48	70.42
	Loco-regional (n = 54)[b]	23.83	5.50	37.76	67.09
	Metastatic (n = 85)[c]	18.82	4.98	30.22	54.02
		p = 0.000*, a,b>c	p = 0.000*, a>b,c	p = 0.000*, a,b >c	p = 0.000*, a,b >c
Stage of cancer	I (n = 10)[a]	29.20	7.50	47.70	84.40
	II (n = 96)[b]	25.86	6.30	41.40	73.55
	III (n = 89)[c]	21.03	5.43	33.85	60.31
	IV (n = 41)[d]	16.61	5.17	26.51	48.29
		p = 0.000*,† a,b >d b>c	p = 0.024*,† a>d	p = 0.000*,† a,b >d b>c	p = 0.000*,† a,b>c,d
ECOG - PSR	0 (n = 27)[a]	31.96	6.67	52.44	91.07
	1 (n = 113)[b]	25.25	6.39	40.96	72.60

		Stress Reduction	Making Decisions	Positive Attitude	SUPPH total scale
		mean	mean	mean	mean
	2 (n = 58)[c]	19.83	5.72	30.29	55.84
	3+4 (n = 38)[d]	12.16	3.68	19.71	35.55
		p = 0.000*,†	p = 0.000*,†	p = 0.000*,†	p = 0.000*,†
		a,b >c>d	a,b,c>d	a,b >c>d	a,b>c>d
History of cancer surgery	Yes (n = 102)	22.51	5.33	36.07	63.91
	No (n = 134)	22.63	6.19	36.36	65.18
		p = 0.93‡	p = 0.025*,‡	p = 0.90‡	p = 0.75‡
History of radiotherapy	Yes (n = 50)	18.60	4.88	29.06	52.54
	No (n = 186)	23.65	6.08	38.16	67.88
		p = 0.002*,‡	p = 0.010*,‡	p = 0.001*,‡	p = 0.001*,‡
Cycles of chemotherapy	≤6 (n = 117)	21.84	5.50	35.11	62.45
	≥7 (n = 108)	23.11	6.01	36.55	65.67
		p = 0.36‡	p = 0.18‡	p = 0.54‡	p = 0.41‡
Chemotherapy agents	Platin based (n = 83)	22.29	5.84	36.17	64.40
	Non-Platin based (n = 153)	22.68	5.81	36.27	64.76
		p = 0.84‡	p = 0.94‡	p = 0.97‡	p = 0.93‡
Time since beginning of chemotherapy	0-3 months (n = 95)	21.58	5.88	34.36	61.82
	4-6 months (n = 75)	22.11	5.95	36.16	64.21
	≥7 months (n = 66)	24.55	5.59	39.02	69.15
		p = 0.19	p = 0.75	p = 0.26	p = 0.30

SUPPH: Strategies Used by Patients to Promote Health ‡ = t-test; = One Way ANOVA test; † = Kruskal-Wallis H test *p <0.05, p values are presented for t-test and One Way ANOVA test and Kruskal-Wallis H test.

5.4. Comparison of Quality of Life Scores with Personal-, Disease- and Treatment-Related Characteristics

Statistical analyses revealed that there were statistically significant differences between the quality of life scores with respect to perceived financial status. Patients who stated their income level as poor obtained lower scores from Physical well-being, Social/Family well-being and FACT-G dimensions than patients with moderate or good perceived income level ($p < 0.05$) (Table 4).

Table 4. *Comparison of FACT-G scale means with patients' personal characteristics.*

		PWB	SWB	EWB	FWB	FACT-G
		mean	mean	mean	mean	mean
Gender	Female (n = 103)	12.67	15.91	9.28	11.50	49.36
	Male (n = 133)	12.38	16.52	9.80	12.11	50.82
		p = 0.77‡	p = 0.41‡	p = 0.54‡	p = 0.51‡	p = 0.64‡
Age group	≤50 (n = 60)	12.85	16.37	8.43	10.70	48.36
	51-60 (n = 76)	13.38	17.39	10.50	12.82	54.09
	≥61 (n = 100)	11.64	15.32	9.56	11.79	48.31
		p = 0.27	p = 0.05	p = 0.18	p = 0.23	p = 0.21
Marital status	Married (n = 197)	12.21	16.49	9.51	11.70	49.91
	Not married (n = 39)	14.00	15.05	9.90	12.59	51.54
		p = 0.16‡	p = 0.22‡	p = 0.76‡	p = 0.45‡	p = 0.57‡
Education	No formal education (n = 73)	12.05	16.46	10.23	11.93	50.68
	Formal education (n = 163)	12.71	16.16	9.28	11.80	49.96
		p = 0.52‡	p = 0.71‡	p = 0.30‡	p = 0.90‡	p = 0.83‡
Perceived income level	Poor (n = 72)	10.38	14.48	9.11	10.38	44.34
	Moderate (n = 111)	13.37	16.98	10.17	12.80	53.32
	Good (n = 53)	13.60	17.15	8.96	11.83	51.54
		p = 0.011*, a<b,c	p = 0.006*, a<b,c	p = 0.41	p = 0.08	p = 0.034*, a<b
Employment during illness	Currently working (n = 23)	15.04	17.47	11.96	14.96	59.43
	Not working due to cancer (n = 106)	12.10	16.06	9.20	11.52	48.88
	Not working due to other reasons (n = 107)	12.36	16.18	9.44	11.50	49.48
		p = 0.20†	p = 0.61†	p = 0.15†	p = 0.89†	p = 0.87†

‡ = t-test; = One Way ANOVA test; † = Kruskal-Wallis H test *p <0.05, p values are presented for t-test and One Way ANOVA test and Kruskal-Wallis H test. PWB: Physical well-being, SWB: Social/Family well-being, FWB: Functional well-being, EWB: Emotional well-being

The patients with better ECOG score obtained higher scores from Physical well-being, Emotional well-being, Social/Family well-being and Functional well-being dimensions and FACT-G total scale. The results showed that patients low-performance status experienced more negative changes in each dimension of quality of life ($p < 0.05$) (Table 5).

Statistical analyses revealed that there were statistically significant relationships between quality of life scores with respect to the presence of metastasis, stage of cancer, the history of radiotherapy and a cancer surgery ($p < 0.05$) (Table 5).

Means of subscales were compared with disease-related characteristics. As a result of further analysis, the means of scale score were compared with respect to the presence of metastasis. In general, the scores of patients with local cancer or loco-regional metastasis were higher than those with distant-organ metastasis (Table 5).

The means of scale score were also compared with respect to stage of cancer. In general, the scores of patients with cancer stage I and II were higher than patients with cancer stage III and IV (Table 5).

Patients with the history of radiotherapy had a lower quality of life scores from Functional well-being and Emotional well-being, subscales, and FACT-G total scale score in comparison to the patients without the history of radiotherapy. Patients who previously undergone a cancer surgery had higher Social/Family well-being scale scores than those who did not undergo any surgical procedures (Table 5).

The study did not find any statistically significant differences between the quality of life scores with respect to chemotherapy protocol and type of cancer, age, the number of chemotherapy cycles, the length of time since cancer diagnosis and time since chemotherapy ($p > 0.05$) (Table 5).

Table 5. *Comparison of FACT-G scale means with disease- and treatment-related characteristics.*

		PWB	SFWB	EWB	FWB	FACT-G
		mean	**mean**	**mean**	**mean**	**mean**
Cancer	Lung (n = 73)	11.63	16.01	8.99	11.16	47.89
	Colorectal (n = 61)	12.95	16.89	10.30	12.90	24.26
	Breast (n = 60)	13.42	16.72	9.78	11.88	51.80
	Stomach (n = 42)	12.10	15.09	9.26	11.26	47.71
		p = 0.51	p = 0.38	p = 0.68	p = 0.55	p = 0.49
Time since cancer diagnosis	≤12 months (n = 129)	12.67	17.22	10.33	12.34	52.56
	≥13 months (n = 107)	12.31	15.09	8.67	11.24	47.31
		p = 0.70‡	p = 0.004*,‡	p = 0.049*,‡	p = 0.24‡	p = 0.07‡
Presence of metastasis	Local (n = 71)[a]	14.10	15.72	10.63	13.62	54.07
	Loco-regional (n = 54)[b]	14.65	17.45	11.07	13.50	56.67
	Metastatic (n = 85)[c]	8.98	14.80	6.40	8.59	38.76
		p = 0.000*, a,b>c	p = 0.023*, b>c	p = 0.000*, a,b>c	p = 0.000*, a,b>c	p = 0.000*, a,b>c
Stage of cancer	I (n = 10)[a]	16.10	19.05	13.60	18.20	66.95
	II (n = 96)[b]	16.24	18.32	12.73	14.86	62.15
	III (n = 89)[c]	10.82	14.79	7.61	10.39	43.61
	IV (n = 41)[d]	6.56	13.93	5.49	6.37	32.34
		p = 0.000*,† a,b,c>d b>c	p = 0.000*,† b>c,d	p = 0.000*,† a,b>c,d	p = 0.000*,† a,b>c>d	p = 0.000*,† a,b>c,d
ECOG-PRS ‡	0 (n = 27)[a]	21.81	20.19	13.37	18.70	74.08
	1 (n = 113)[b]	15.11	17.49	11.83	14.31	58.73
	2 (n = 58)[c]	9.19	14.40	7.55	8.53	39.68
	3+4 (n = 38)[d]	3.24	12.62	3.26	4.68	23.80
		p = 0.000*,† a>b>c>d	p = 0.000*,† a,b>c,d	p = 0.000*,† a,b>c>d	p = 0.000*,† a,b>c>d	p = 0.000*,† a,b>c>d
History of cancer surgery	Yes (n = 102)	13.36	17.35	9.45	11.75	51.90
	No (n = 134)	11.86	15.42	9.67	11.92	48.87
		p = 0.13‡	p = 0.009*,‡	p = 0.80‡	p = 0.86‡	p = 0.43‡
History of radiotherapy	Yes (n = 50)	10.62	17.34	6.88	9.38	44.22
	No (n = 186)	13.02	15.96	10.30	12.51	51.79
		p = 0.07‡	p = 0.13‡	p = 0.001*,‡	p = 0.006*,‡	p = 0.020*,‡
Cycles of chemotherapy	≤6 (n = 117)	12.68	16.10	9.25	11.57	49.60
	≥7 (n = 108)	12.11	16.30	9.88	11.94	50.24
		p = 0.55‡	p = 0.79‡	p = 0.46‡	p = 0.70‡	p = 0.80‡
Chemotherapy agents	Platin based (n = 83)	12.36	15.91	9.57	11.95	49.79
	Non-platin based (n =153)	12.59	16.44	9.58	11.78	50.40
		p = 0.82‡	p = 0.49‡	p = 0.99‡	p = 0.86‡	p = 0.86‡
Time since beginning of chemotherapy	0-3 months (n = 95)	11.61	15.82	10.13	11.69	49.25
	4-6 months (n = 75)	12.03	16.94	9.36	12.13	50.46
	≥ 7 months (n = 66)	14.35	16.11	9.03	11.73	51.21
		p = 0.05	p = 0.43	p = 0.54	p = 0.91	p = 0.96

‡ = t-test; = One Way ANOVA test; †= Kruskal-Wallis H test *p <0.05, p values are presented for t-test and One Way ANOVA test and Kruskal-Wallis H test. PWB: Physical well-being, SWB: Social/Family well-being, FWB: Functional well-being, EWB: Emotional well-being ECOG- PRS: Eastern Cooperative Oncology Group Performance Status Ratings (PSR); 0: normal activity; 1 Some symptoms, but no bedrest during daytime; 2 Less than 50% daytime in bed; 3: More than 50% daytime in bed, Some symptoms, but no bedrest during daytime 4: Unable to get out of bed.

6. Discussion

Recognition of symptoms such as fatigue and measurement of quality of life and factors contributing to self-care behaviors across the trajectory of cancer is valuable for helping cancer patients for dealing with persistent symptoms and improving psychological and social functioning and well-being. The current study found that the patients, with distant metastasis and who underwent radiotherapy were more fatigued compared to those with local cancer or loco-regional metastasis, and who did not undergo radiotherapy. These findings showed that patients with distant-organ metastasis and the history of radiotherapy needed more support for the management of fatigue during chemotherapy for improving functional status and emotional status, and in general quality of life.

Cancer treatments such as chemotherapy and radiotherapy and disease itself lead to numerous side effects. Fatigue was one of the common and the most debilitating side effects. There are many disease-related factors such as direct effect of cancer and treatment-related factors contribute to cancer-related fatigue. Patients with advanced cancer have poor functional status and experience serious side effects associated with cancer and cancer treatment [24]. The current study found that the patients with cancer stage III or IV felt higher fatigue. This result showed that patients with advanced cancer experience more detrimental changes in the functional status due to cancer and treatment-related fatigue and needed more support for the management. Patients with advanced stage of cancer should undergo more frequent fatigue assessments, and supported using fatigue management techniques based on personal needs.

Personal characteristics, social support, cancer and treatment modalities may influence the perceptions for fatigue and coping styles. The current study did not find statistically significant differences between fatigue scores with respect to patient's demographic characteristics. A study conducted on breast cancer patients undergoing radiotherapy reported that age, education level, and marital status were associated with the quality of life scores. A study found women with the low education and poor living conditions and women younger (≤50 years) and older (≥50 years) had the low level of fatigue and better quality of life scores [25].

Increasing the patients' knowledge and confidence (self-efficacy) will promote skills required for self-management and quality of life. Individual's confidence or belief in their capacity have higher motivation and undertake complex tasks or behaviours required for self-management of chronic situations [14], [15], [16]. Higher levels of self-efficacy in patients with chronic conditions were significantly associated with better the quality of life [26], [27], [28], [29]. Higher self-efficacy predicted greater symptom management behaviors and better relief in cancer patients undergoing chemotherapy [30].

A study conducted on Turkish breast cancers (Akin et al., 2008) reported that self-efficacy were influenced by personal and medical characteristics [31]. A study conducted on women with breast cancer found that only patient's education and the time passed since diagnosis was the predictor of cancer-related self-efficacy [32].

Depending on the personal characteristics, chronic condition, social support and existing self-efficacy, the individuals may experience decline in self-efficacy associated with disease burden. Assessment of self-efficacy during the chronic disease trajectory will help identify patients at risk and choose appropriate supportive strategies. A study (Gallagher et al. 2008) conducted to examine the self-management of patients with chronic conditions found that there were a close relationship between low self-efficacy and poor self-management [14]. Self-efficacy was found to be the only predictor for improving self-management in patients with chronic illness [14].

Married people are expected to deal with much successfully with burden of their new social roles and responsibilities than those who were single. The burden of social responsibilities can pose a pressure on married people during adjustment to cancer treatment. The cancer diagnosis, uncertainty and cancer treatments cause stress, emotional reactions and social and physical constraints make negative impacts on cancer patients' coping skills. The current study found that the married cancer patients were less confident in performing stress reduction strategies, had less positive attitudes, and in general lower self-care self-efficacy than unmarried cancer patients had. Self-efficacy of married people might be influenced more negatively due to lack of social support and difficulty in dealing with social responsibilities and growing pressure of treatment side effects during chemotherapy. Social support has been found to be linked to the cancer-related self-efficacy in breast cancer patients [32]. These results of the current study showed that married women needed more social support and encouragement for developing positive attitudes and coping with cancer and treatment.

Experiences help patients gain more self-confidence in making the decision for the health, treatment and adopting healthy life-style. Patients who previously undergone a cancer surgery had more confidence in making the decision about the cancer treatment and symptom management than those who did not undergo any surgical procedures. This result showed that cancer patients, especially with the previous history of cancer treatment, gained positive experiences from treatments and that the cancer patients were socially supported for dealing with cancer treatment effects.

The means of self-efficacy scale scores were compared in relation to history of previous radiotherapy. The cancer patients who underwent radiotherapy previously had lower self-efficacy scores from each dimension in comparison to the patients who did not undergo radiotherapy. This finding of the current study suggests that cancer patients with the history of radiotherapy needed more support in improving self-confidence, stress management, developing positive attitudes and self-care behaviors and functional status.

The stage of cancer and functional performans status might influence the patients' active participation in healthy lifestyle choices and the maintenance of healthy behaviours. In the current study, self-care self-efficacy was lower in patients with distant-organ metastasis, stage III or IV than those with local cancer or loco-regional metastasis. This results showed the patients with advanced cancer needed more support in maintaining self-confidence for performing self-care and daily living activities.

Self-efficacy was predicted by advanced cancer patients' performance status [28]. In the current study, the cancer patients with poorer functional performans status had lower self-efficacy. The results showed that patients low-performance status experienced more negative changes in each dimension of self-efficacy. Thus, the cancer patients with worse functional status needed to be encouraged for improving own well-being. Positive feedbacks, social and tangible support should be provided for the patients with worse performance status. Interestingly, in the current study SUPPH scale scores did not correlate with cancer patient's age, the number of chemotherapy cycles, the length of time since cancer diagnosis and time since chemotherapy.

A study conducted on cancer patients (Mystakidou et al., 2010) revealed that the self-efficacy was predicted by advanced patients' age and gender [28]. However, the current study did not find any difference between self-efficacy with respect to age and gender.

It is critical to assess the quality of life in clinical practice in order to determine the personal and clinical factors that may interfere with the quality of life in cancer patients. A study (Akin et al., 2008) conducted on Turkish breast cancers reported that the quality of life was influenced by personal and medical characteristics [30]. In the current study, the quality of life scale scores was compared with sociodemographic-characteristics such as age groups, gender, marital status and perceived financial status. The current study did not determine any statistically significant difference between the quality of life scores with respect to age groups, gender, and marital status. Contrast to the current study, another study conducted on cancer patients (Dehkordi et al., 2009) did not find any correlation between the quality of life and variables such as age, sex, marital status, duration of disease, educational level, economic conditions, and occupational function [33].

The quality of life in lung cancer patients was linked with age [34]. A study conducted on colorectal cancers reported that the quality of life scores differed statistically with relation to the patients' gender and age groups [35]. Similar to the current study, a study conducted on women with breast cancer found there were no statistical significances in the quality of life scores with respect to demographic variables [36].

Statistical analyses revealed that there were statistically significant differences between the quality of life scores with respect to perceived financial status. Patients who stated their income level as poor obtained lower scores from Physical well-being, Social/Family well-being and FACT-G total scale than patients with moderate or good perceived income level.

The patients with better ECOG score obtained higher scores from Physical well-being, Emotional well-being, Social/Family well-being and Functional well-being dimensions and FACT-G total scale. The results showed that patients with low-performance status experienced more negative changes in each dimensions of the quality of life, thus these patients need more support for improving performance status.

Variables related to cancer and treatment of the disease may influence the quality of life. Further analysis displayed that the scores of patients with local cancer or loco-regional metastasis were higher than with distant-organ metastasis. The patients with cancer stage II or I were higher than patients with cancer stage III and cancer stage IV. A study reported that metastatic breast cancer patients and younger patients ($\leq$ 50 years old with early-stage or locally advanced) had the lower quality of life [37]. The cancer stage was showed to be the major determinants of the quality of life in neck, esophagus, stomach and colorectal cancers [38].

Patients who underwent radiotherapy had lower quality of life scores from Functional well-being and Emotional well-being, subscales, and FACT-G total scale score in comparison to the patients who did not undergo radiotherapy. These findings suggest that patients with the history of radiotherapy need more interventions during chemotherapy for improving functional status and emotional status, and in general quality of life.

Patients face many problems associated with the cancer surgery. Studies reported cancer patients experienced negative changes in the quality of life following surgery [39], [40]. Social support is a predictor with coping with the surgery associated impairments. A study conducted on breast cancer patient found that social support and health-related functioning well-being was related quality of life after breast cancer surgery [39]. In the current study, the patients who previously undergone a cancer surgery had higher Social/Family well-being scale scores than those who did not undergo any surgical procedures. This result of the current study showed that cancer patients received social support during cancer treatment.

Patients face serious side effects and deterioration in quality of life due to chemotherapy. The study did not find any statistically significant differences between the quality of life scores with respect to chemotherapy protocol and respect to the type of cancer. However, a study conducted on colorectal cancers reported that the quality of life scores differed statistically with relation to the chemotherapy protocol [35]. A study conducted on women with breast cancer found there was no statistical significance in the quality of life scores with respect to stage of cancer, time since the diagnosis of cancer and chemotherapy [36].

The current study did not find any correlation between the quality of life scores and patient's age, the number of chemotherapy cycles, the duration of cancer diagnosis and time since chemotherapy. Consistent with the current study, another study found that the number of cycles of chemotherapy in patients with colorectal cancer to be

associated with overall quality of life and social well-being [24].

7. Conclusion

The study results showed that the clinical variables are more influential on self-confidence in performing self-care behaviors, fatigue and functional status than sociodemographic characteristics. Nurses need to focus on patients' disease and chemotherapy variables in the assessment of functional status and management of clinical problems. The study findings represent only the patients treated at one oncology center and those diagnosed with breast, lung, colorectal or stomach cancer. Conducting studies exploring the cultural characteristics and other psychosocial variables will provide valuable data for improving the self-efficacy and quality of life during chemotherapy.

Key Points for Decision Makers

(a) Psychosocial factors influence the adaptation with the illness such as social support, sociodemographic characteristics, and perceived control and beliefs.
(b) Self-beliefs affect personal growth, coping strategies, daily functioning, managing the fatigue, and adaptation to cancer and treatment and survivorship.
(c) Studies aiming to explore the relationship between self-efficacy and psychosocial factors, and other personal characteristics will help tailor more effective management strategies based on patients needs.

References

[1] Neipp MC, López-Roig S, Pastor MA. Control beliefs in cancer: A literature review. Anuario de Psicología. 2007; 38 (3): 333-355.

[2] Iconomou G, Mega V, Koutras A, et al. Prospective assessment of emotional distress, cognitive function, and quality of life in patients with cancer treated with chemotherapy. Cancer. 2004; 101 (2): 404-11.

[3] Crandall A, Abdul-Rahim HF, Yount KM. Validation of the general self-efficacy scale among Qatari young women. East Mediterr Health J. 2016; 21 (12): 891-896.

[4] Luszczynska A, Mohamed NE, Schwarzer R. Self-efficacy and social support predict benefit finding 12 months after cancer surgery: The mediating role of coping strategies. Psychology, Health & Medicine. 2005; 10 (4): 365-375.

[5] Akın S, Can G, Durna Z, et al. The quality of life and self-efficacy of Turkish breast cancer patients undergoing chemotherapy. Eur J Oncol Nurs. 2008; 12 (5): 449-56.

[6] Ungar N, Wiskemann J, Sieverding M. Physical activity enjoyment and self-efficacy as predictors of cancer patients' physical activity level. Front Psychol. 2016; 7: 898.

[7] Curtis R, Groarke A, Sullivan F. Stress, and self-efficacy predict psychological adjustment at diagnosis of prostate cancer. Sci Rep. 2014; 4 (5569): 1-5.

[8] Putting Evidence into Practice (PEP) Oncology Nursing Society 2016. https://www.ons.org/practice-resources/pep/fatigue Accessed date: 28.1.2017.

[9] Yokoyama T, Kurokawa Y, Kani R, et al. [Assessment of health-related quality of life in cancer outpatients treated with chemotherapy]. Gan To Kagaku Ryoho. 2012; 39 (3): 409-14. [abstract].

[10] Polanski J, Jankowska-Polanska B, Rosinczuk J, et al. Quality of life of patients with lung cancer. Onco Targets Ther. 2016; 9: 1023-8.

[11] Foster C, Breckons M, Cotterell P, Barbosa D, Calman L, Corner J, et al. Cancer survivors' self-efficacy to self-manage in the year following primary treatment. J Cancer Surviv. 2015; 9 (1): 11-9.

[12] Rotonda C, Guillemin F, Bonnetain F, Conroy T. Factors correlated with fatigue in breast cancer patients before, during and after adjuvant chemotherapy: the FATSEIN study. Contemp Clin Trials. 2011; 32 (2): 244-9.

[13] van Houtum L. Self-management and support needs of chronically ill people. Nivel, P. O. Box 1568, 3500 BN Utrecht, The Netherlands. 2015.

[14] Gallagher R, Donoghue J, Chenoweth L, et al. Self-management in older patients with chronic illness. International Journal of Nursing Practice. 2008; 14 (5): 373-82. doi: 10.1111/j.1440-172X.2008.00709.x.

[15] Bandura A. Self-efficacy: Toward a unifying theory of behavioral change. Psychological Review. 1977; 84 (2): 191-215.

[16] Franek J. Self-management support interventions for persons with chronic disease: an evidence-based analysis. Ont Health Technol Assess Ser [Internet]. 2013 September; 13 (9): 1-60. Available from: http://www.hqontario.ca/en/documents/eds/2013/full-report-OCDM-self-management.pdf

[17] FACIT-F Scoring Guidelines (Version 4) FACIT-F scoring template 21 May 2003. Accessed date: 2016.

[18] Lev EL, Owen SV. A measure of self-care self-efficacy. Res Nurs Health. 1996; 19 (5): 421-429.

[19] Lev EL, Paul DB, Owen SV. Age, self-efficacy, and change in patients' adjustment to cancer. Cancer Pract. 1999; 7 (4): 170-176.

[20] Lev EL, Owen SV. Counseling women with breast cancer using principles developed by Albert Bandura. Perspect Psychiatr Care. 2000; 36 (4): 131-138.

[21] Lev, EL, Daley K, Conner N, Reith M, et al. An intervention to increase the quality of life and self-care self-efficacy and decrease symptoms in breast cancer patients. Sch Inq Nurs Pract. 2001; 15 (3): 277-294.

[22] Owen SV, Lev EL. Confirmatory factor evidence for the SUPPH. Presented at the 13th Annual Scientific Sessions of the Eastern Nursing Research Society. Atlantic City, NJ. 2001.

[23] Lev EL. Definition, measurement, theoretical basis, and relationships associated with self-care self-efficacy. Convenor of Symposium, 13th Annual Scientific Sessions, Eastern Nursing Research Society. Atlantic City: N. J. 2001. pp. 71.

[24] Rotonda C, Guillemin F, Bonnetain F, Conroy T. Factors correlated with fatigue in breast cancer patients before, during and after adjuvant chemotherapy: the FATSEIN study. Contemp Clin Trials. 2011; 32 (2): 244-9. doi: 10.1016/j.cct.2010.11.007. Epub 2010 Nov 13.

[25] Muszalik M, Kołucka-Pluta M, Kędziora-Kornatowska K, et al. Quality of life of women with breast cancer undergoing radiotherapy using the Functional Assessment of Chronic Illness Therapy-Fatigue questionnaire. Clin Interv Aging. 2016; 11: 1489-1494.

[26] Haugland T. Stress, social support, general self-efficacy and health related quality of life in patients with neuroendocrine tumors. A cross-sectional and pilot study. Department of Global Public Health and Primary Care, Faculty of Medicine and Dentistry. 2013.

[27] Mersal FA, Mersal NA. Effect of evidence based lifestyle guidelines on self efficacy of patients with hypertension. International Journal of Current Microbiology and Applied Sciences. 2015; 4 (3): 244-263.

[28] Mystakidou K, Tsilika E, Parpa E, Gogou P, Theodorakis P, Vlahos L. Self-efficacy beliefs and levels of anxiety in advanced cancer patients. European Journal of Cancer Care (Engl). 2010; 19 (2): 205-11. doi: 10.1111/j.1365-2354.2008.01039.x.

[29] Walker RJ, Smalls BL, Hernandez-Tejada MA, Campbell JA, Egede LE. Effect of diabetes self-efficacy on glycemic control, medication adherence, self-care behaviors, and quality of life in a predominantly low-income, minority population. Ethnicity Disease. 2014; 24 (3): 349-55.

[30] Lou Y, Yates P, McCarthy A, et al. Fatigue self-management: a survey of Chinese cancer patients undergoing chemotherapy. J Clin Nurs. 2013; 22 (7-8): 1053-65.

[31] Akin S, Can G, Durna Z, et al. The quality of life and self-efficacy of Turkish breast cancer patients undergoing chemotherapy. European Journal of Oncology Nursing. 2008; 12 (5): 449-56. doi: 10.1016/j.ejon.2008.07.006.

[32] Nejad ZK, Aghdam AM, Hassankhani H, et al. Cancer-related self-efficacy in Iranian women with breast cancer. Women's Health Bulletin. 2015; 2 (2): e23248.

[33] Dehkordi A, Saeed Heydarnejad M, Fatehi D. Quality of life in cancer patients undergoing chemotherapy. Oman Medical Journal. 2009; 24: 204-207 doi: 10.5001/omj.2009.40.

[34] Bozcuk H, Dalmis B, Samur M, et al. Quality of life in patients with advanced non-small cell lung cancer. Cancer Nurs. 2006; 29 (2): 104-10.

[35] Goździewicz B, Strugała M, Talarska D, et al. Functioning of people with colorectal cancer during chemotherapy. Demographic and clinical determinants of quality of life of patients with colorectal cancer receiving chemotherapy. Pilot study. Eur J Cancer Care (Engl). 2016 Dec 27. doi: 10.1111/ecc.12616.

[36] Rabin EG, Heldt E, Hirakata VN, et al. Quality of life predictors in breast cancer women. Eur J Oncol Nurs. 2008; 12 (1): 53-7.

[37] Hamer J, McDonald R, Zhang L, et al. Quality of life (QOL) and symptom burden (SB) in patients with breast cancer. Support Care Cancer. 2017; 25 (2): 409-419.

[38] Ravasco P, Monteiro-Grillo I, Vidal PM, et al. Cancer: disease and nutrition are key determinants of patients' quality of life. Support Care Cancer. 2004; 12 (4): 246-52.

[39] Olsson M, Nilsson M, Fugl-Meyer K, et al. Life satisfaction of women of working age shortly after breast cancer surgery. Qual Life Res. 2017; 26 (3): 673-684.

[40] Näsvall P, Dahlstrand U, Löwenmark T, et al. Quality of life in patients with a permanent stoma after rectal cancer surgery. Qual Life Res. 2017; 26 (1): 55-64.