

Factors affecting the quality of life of cancer patients undergoing chemotherapy: A questionnaire study

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ABSTRACT

Objective: This descriptive and cross-sectional study was undertaken to determine the factors affecting cancer patients' quality of life. **Methods:** We collected data from 352 chemotherapy patients of an Outpatient Chemotherapy Unit in a state hospital. We included volunteered chemotherapy patients with a signed informed consent and at least 50 Karnofsky Performance Scale points. We gathered data by Personal Information Form and Nightingale Symptom Assessment Scale (N-SAS) and analyzed via basic descriptive statistics and linear regression analysis. **Results:** Patients were women (54.8%), married (83.5%), elementary school graduates (57.1%), housewives (44.6%) and undergoing fluorouracil-based therapy (47.2%), and almost all patients had religious and cultural rituals for the disease. Women experienced worse physical and social well-being than men ($P = 0.001$, $P = 0.0001$). Singles had worse psychological and

general well-being ($P = 0.0001$, $P = 0.0001$). Housewives had the worst physical and social well-being ($P < 0.05$). No relationship existed between education level and life quality ($P > 0.05$). Breast cancer and sarcoma patients had the worst social well-being than other cancer patients. The N-SAS points of patients were not affected by blessings/prays, vow/sacrifice, consulting local herbalists and visiting "ocaks (folk physicians)" ($P > 0.05$). Patients with bad quality of life practiced lead pouring and amulets ($P < 0.05$). Gender was the first factor affecting the quality of life. **Conclusion:** Advanced studies on individual quality of life factors affecting cancer would empower nurses for better personal care techniques and patients for easily overcoming the disease.

Key words: Cancer, chemotherapy, life quality, nursing care

Introduction

Cancer, faced every day, is second to heart disease as a cause of death. One-fourth of the deaths in the USA were because of cancer; daily 1600 Americans^[1] and 1.75 millions of Europeans in 2012.^[2]

Cancer patients face some psychological problems — stress, anxiety, depression; some physiological side-effects — hair loss, pain, tiredness, nausea, vomiting; some social side-effects — social isolation, role and function loss; and, eventually, a worsened quality of life.^[3-5]

The purpose of cancer therapy is not only to cure the cancer and increase the survival but also to minimize the symptoms and alleviate the quality of life. In other words, better quality of life increases patients' adaptation and desire for the therapy. Higher quality of life leads patients to complete therapy with the lowest harm, control experienced symptoms and overcome these symptoms.^[6]

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Quality of life is an individuals' perception of their aims, expectations, interests and ideas, satisfaction and happiness among their cultural and values as a whole.^[7] Quality of life is the effect of patients' physical (movement, physical activities and ability to succeed in work and in family responsibilities), social (social activities, being beneficial, body image, anxiety and depression) and psychological (life satisfaction, social support need and role function) for well-being. Symptoms of disease and therapy are pain, respiration difficulty, nausea, alopecia, impotence and, of course, side-effects of the same.^[8,9]

Many factors affect quality of life positively or negatively. Tiredness, anxiety, concern for the future and the family, difficulties to meet basic demands and changes in body image worsen the quality of life of cancer patients.^[3,5] Social support, economic security and faith in recovery improve the quality of life.^[10-12]

Cancer patients make use of complementary therapies in order to improve their qualities of life. Cancer and chemotherapy worsen quality of life and increase the need for complementary therapy.^[13] Patients with lower quality of life prefer more complementary therapy.^[14,15] The religion, beliefs and cultural rituals may interact with each other and crises faced increase religious practices.^[16] Religious and spiritual practices improve quality of life, physical well-being, hope and general life satisfaction, and diminish anxiety.^[17,18] Religion, a factor to overcome the disease, is related to socio-cultural and economic characteristics of individuals.^[19] Further studies on cancer factors affecting quality of life of patients would allocate oncology nurses better personal care techniques in order to help those cancer patients effectively.

We carried out this study in order to determine the factors affecting the quality of life of cancer patients. The research questions were:

1. Is there any relationship between socio-demographic characteristics of cancer patients and their N-SAS points?
2. Is there any relationship between medical characteristics of cancer patients and their N-SAS points?
3. Is there any relationship between N-SAS points of patients with complementary/religious therapies and without?
4. Is there any relationship between gender and their N-SAS points?

Materials and methods

Study design and sample

We implemented this descriptive cross-sectional study in the Daytime Chemotherapy Unit (for patients ≤ 18 years of age) of the College District Outpatients in the Ankara Numune Training and Research Hospital. The universe of the study was 526 patients undergoing chemotherapy in the Daytime Chemotherapy Unit during January–June 2013. We did not sample, but excluded some patients – those rejected to participate ($n = 58$) at the beginning, stopped participating during the study ($n = 62$) because of tiredness, nausea, vomiting and pain etc. had lower than 50 Karnofsky Performance Scale (KPS) point ($n = 9$) and took just the first chemotherapy ($n = 45$). Therefore, we only reached 352 of the patients, and a response rate of 66.9%.

Ethical considerations

We obtained ethical permission from the Ankara University Ethics Board (numbered 589 and dated September 27th, 2012) for the study. We acquired another permission (numbered 85346189/1426 and dated January 9th, 2013) from the Ankara Numune Training and Research Hospital through the First General Secretariat of Turkish Public Hospitals Foundation, in order to apply the study there. We also obtained informed consents from the patients after explaining the study to them clearly.

Inclusion criteria

We included chemotherapy taking volunteering patients with at least 50 Karnofsky Performance Scale points and with an informed consent form signed. We included patients with cancer diagnosis and chemotherapy cure without differentiating the cancer type.

Pilot trial and data collection

The pilot study was performed on 30 individuals who were excluded from the research and the questionnaire was then modified based on the pilot study. We collected data from 352 patients during January–June 2013. We filled out the questionnaires via face to face interviews after obtaining informed consents. The average time for each questionnaire was 20 min. We directly asked the patients about their demographic backgrounds, cancer history and complementary therapy. Information on diagnosis, phase and chemotherapy taken were, however, composed from medical files. We preferred the word “the disease” in the surveys in case patients as they did not know whether they had “cancer” or not yet. Patients, if literate, filled out the Nightingale Symptom Assessment Scale (N-SAS), which

measures the quality of life of patients. If illiterate, we read and recorded the answers.

Instruments

Questionnaires were two part: Demographic data in the first part and N-SAS in the second part.^[20] We determined the suitability of patients for the study by checking for the KPS^[21] before the application of the questionnaire.

Personal information form

This first part contained patient information. We ourselves prepared the form, based on the literature.^[22-26] It contained age, gender, data on disease and geographic origin. Moreover, information on whether anyone in the family was diagnosed as having cancer, its degree and complementary therapy and cultural/religious rituals practiced was collected by open-ended questions. We grouped open-ended questions before the evaluation.

N-SAS

We used the N-SAS to evaluate patients' quality of life. The N-SAS is a quality of life scale for cancer patients. It has 38 items and three sub-scales: Physical well-being (PhWB; 1-4th, 6-15th, 23-27th and 37th item), social well-being (SoWB; 5th and 16-22nd items) and psychological well-being (PsWB; 28-36th and 38th items). Each item in the scale expressed the degree of the influence from each problem while the scale and sub-scales reflected the quality of life. This Likert type (0-4) scale assess answers from 0 (none) to 4 (too much). The higher values indicate the higher problems faced during the therapy.^[20]

Sub-scale points were calculated by dividing summed points of all items by item numbers and general scale points by dividing summed points of all sub-scales by three. No answer existed for some questions (i.e., the effect of disease on sexual life in singles/divorced/widows). Higher points in sub-scales indicated lower well-being for general or special sub-scale goodness.

Life quality points between 0 and 0.50 meant "very good," between 0.51 and 1.50 meant "good," between 1.51 and 2.50 meant "moderate," between 2.51 and 3.50 meant "bad" and between 3.51 and 4.00 meant "very bad." Cronbach alfa values of the scale were PhWB $\alpha = 0.81$, SoWB $\alpha = 0.87$ and PsWB $\alpha = 0.9$.^[27] We calculated the PhWB $\alpha = 0.822$, SoWB $\alpha = 0.697$ and PsWB $\alpha = 0.862$ for the sub-scales. General well-being α , calculated on overall N-SAS, was 0.888.

Statistical analysis

Data, after being coded, were analyzed by SPSS (Statistical package for social sciences for windows 16.0). We used the

significance test for differences between two means and the Mann-Whitney U test for heterogeneous data; one-way analysis of variance for multiple groups and the Tukey HSD test for group comparisons. We also ran linear regression for each gender separately^[28] in order to determine the main variable affecting the quality of life.

Results

Women experienced worse PhWB and SoWB than men ($t = 3.285, P = 0.001; Z = 4.529, P = 0.0001$). Singles had worse PsWB and general well-being than married patients ($t = 14.294, P = 0.0001; t = 13.783, P = 0.0001$). There was no relationship between education and quality of life ($P > 0.05$). Housewives had lower PhWB and SoWB than other groups that were studied ($P < 0.05$). Government clerks had worse PsWB and general well-being than the other groups in the study ($P = 0.0001$) [Table 1].

Table 1: Comparison of patients' socio-demographic values and N-SAS points ($n = 352$)

Descriptive characteristics	n	N-SAS points			
		PhWB	SoWB	PsWB	General well-being
		Mean \pm SD	Mean \pm SD	Mean \pm SD	Mean \pm SD
Gender					
Female	193	0.070 \pm 0.03	0.021 \pm 0.01	0.128 \pm 0.27	0.220 \pm 0.27
Male	159	0.059 \pm 0.02	0.013 \pm 0.01	0.098 \pm 0.23	0.172 \pm 0.23
		$t=3.285^a$ $P=0.001$	$Z=4.529^b$ $P=0.0001$	$t=1.093^a$ $P=0.275$	$t=1.759^a$ $P=0.079$
Marital status					
Married	294	0.065 \pm 0.03	0.018 \pm 0.01	0.046 \pm 0.02	0.130 \pm 0.05
Single	58	0.063 \pm 0.03	0.014 \pm 0.01	0.465 \pm 0.50	0.543 \pm 0.50
		$t=0.497^a$ $P=0.619$	$t=1.862^a$ $P=0.063$	$t=14.294^a$ $P=0.0001$	$t=13.783^a$ $P=0.0001$
Education					
Illiterate	41	0.075 \pm 0.03	0.024 \pm 0.01	0.119 \pm 0.25	0.216 \pm 0.25
Elementary	201	0.065 \pm 0.03	0.018 \pm 0.01	0.096 \pm 0.21	0.179 \pm 0.22
Secondary	33	0.058 \pm 0.03	0.014 \pm 0.01	0.094 \pm 0.23	0.167 \pm 0.24
High school	46	0.060 \pm 0.03	0.019 \pm 0.01	0.159 \pm 0.33	0.239 \pm 0.31
University	31	0.064 \pm 0.03	0.015 \pm 0.01	0.190 \pm 0.36	0.270 \pm 0.37
		$F=1.690^c$ $P=0.152$	$F=1.228^c$ $P=0.299$	$F=1.354^c$ $P=0.250$	$F=1.324^c$ $P=0.261$
Occupation					
Farmer	12	0.053 \pm 0.03	0.012 \pm 0.06	0.033 \pm 0.02	0.098 \pm 0.04
Housewife	157	0.073 \pm 0.03	0.022 \pm 0.01	0.120 \pm 0.25	0.215 \pm 0.25
Retired	59	0.062 \pm 0.03	0.016 \pm 0.01	0.051 \pm 0.12	0.130 \pm 0.13
Temporary (Free lance)	57	0.055 \pm 0.03	0.013 \pm 0.01	0.137 \pm 0.29	0.206 \pm 0.29
Clerk	32	0.065 \pm 0.03	0.014 \pm 0.01	0.160 \pm 0.32	0.240 \pm 0.32
Labor	35	0.056 \pm 0.02	0.013 \pm 0.01	0.149 \pm 0.31	0.219 \pm 0.31
		$F=4.281^c$ $P=0.001^c$	$F=5.301^c$ $P=0.0001^c$	$\chi^2=15.747^d$ $P=0.003$	$\chi^2=21.254^d$ $P=0.0001$

a: Student t test was applied, b: Mann-Whitney U test was applied because of heterogeneity, c: One-way analysis of variance was applied, d: Kruskal-Wallis test was applied because of heterogeneity, e: Tukey test was applied

Patients who were operated first and then took radiotherapy and chemotherapy had lower ($F = 4.820, P = 0.0009$) SoWB than others. Breast, sarcoma and head/neck cancer patients had worse life qualities. Similarly, patients under Taxane therapies had lower SoWB values ($\chi^2 = 29.134, P = 0.0001$) [Table 2].

Blessings or prayers, vow or sacrifice or consulting local herbalists did not affect the N-SAS points ($P > 0.05$). Lead pouring patients had worse quality of life for PhWB and SoWB than no lead pouring ones ($t = 2.735, P = 0.007; t = 2.964, P = 0.003$). Visiting religious people (Hodja or Ocak) did not influence the N-SAS points ($P > 0.05$). Tomb

visitors had worse quality of life for SoWB than non-tomb visitors ($t = 2.363, P = 0.019$) [Table 3]. Amulet use and holy water drinking did not change patients' N-SAS points ($P > 0.05$). Charm use patients, on the other hand, had worse SoWB than non-charm users ($t = 3.582, P = 0.0001$). Patients' religious and cultural rituals for well-being did not affect the quality of life ($P > 0.05$) [Table 3].

Some independent factors affected the quality of life and resulted in some regression models [Table 4]. A higher number of chemotherapy sessions worsened PhWB, singleness PsWB and marriage general well-being in women. Furthermore, a non-permanent job improved

Table 2: Comparison of patients' medical characteristics and N-SAS points ($n = 352$)

Medical characteristics	n	N-SAS points			
		PhWB Mean ± SD	SoWB Mean ± SD	PsWB Mean ± SD	General well-being Mean ± SD
Therapy history					
Only chemotherapy	128	0.063±0.03	0.016±0.01	0.129±0.28	0.209±0.28
Operation + chemotherapy	125	0.063±0.02	0.016±0.01	0.113±0.24	0.193±0.25
Operation + radiotherapy + chemotherapy	99	0.070±0.03	0.021±0.01	0.098±0.23	0.191±0.23
		$F = 1.616^a$ $P = 0.200$	$F = 4.820^a$ $P = 0.009$	$F = 0.401^a$ $P = 0.670$	$F = 0.181^a$ $P = 0.834$
Chemotherapy cure take					
2 nd cure	109	0.059±0.03	0.013±0.01	0.119±0.26	0.191±0.26
3 rd cure	110	0.063±0.03	0.018±0.01	0.122±0.26	0.203±0.26
4 th cure	46	0.076±0.03	0.024±0.01	0.085±0.19	0.185±0.20
5 th cure	28	0.061±0.03	0.019±0.01	0.175±0.34	0.255±0.33
6 th cure	38	0.076±0.03	0.021±0.01	0.043±0.03	0.141±0.06
7 th cure	21	0.069±0.02	0.021±0.01	0.172±0.34	0.263±0.35
		$F = 3.129^a$ $P = 0.009^b$	$F = 4.749^a$ $P = 0.0001^b$	$\chi^2 = 1.092^c$ $P = 0.955$	$\chi^2 = 6.873^c$ $P = 0.230$
Diagnosis					
Lung cancer	24	0.061±0.03	0.013±0.01	0.163±0.32	0.238±0.32
Colorectal cancer	71	0.060±0.03	0.012±0.009	0.132±0.29	0.205±0.28
Lymphoma	17	0.056±0.02	0.017±0.01	0.098±0.23	0.172±0.25
Breast cancer	80	0.072±0.03	0.026±0.01	0.069±0.15	0.167±0.16
Gynecologic cancer	5	0.076±0.01	0.021±0.006	0.058±0.01	0.156±0.01
Sarcoma	12	0.069±0.03	0.022±0.01	0.024±0.02	0.115±0.05
Gastrointestinal cancer	79	0.062±0.03	0.015±0.01	0.102±0.23	0.181±0.24
Head neck cancers	8	0.070±0.03	0.025±0.01	0.159±0.34	0.255±0.34
Urinary cancers	27	0.058±0.02	0.016±0.01	0.151±0.30	0.226±0.29
Multiple myeloma	9	0.067±0.03	0.013±0.007	0.030±0.02	0.111±0.04
Hematologic malignity	20	0.079±0.03	0.019±0.01	0.282±0.42	0.381±0.41
		$F = 1.429^a$ $P = 0.166$	$\chi^2 = 37.860^c$ $P = 0.001$	$\chi^2 = 13.886^c$ $P = 0.178$	$\chi^2 = 14.779^c$ $P = 0.140$
Chemotherapy types taken					
Platinum based	51	0.064±0.02	0.017±0.01	0.102±0.22	0.184±0.23
Fluorouracil based	166	0.063±0.03	0.013±0.01	0.137±0.29	0.214±0.29
Taxane based	59	0.071±0.02	0.025±0.01	0.109±0.24	0.207±0.24
Doxorubicin based	40	0.062±0.03	0.020±0.01	0.037±0.02	0.120±0.06
Targeted therapy	36	0.067±0.03	0.021±0.01	0.126±0.26	0.215±0.26
		$F = 0.775^a$ $P = 0.542$	$\chi^2 = 29.134^c$ $P = 0.0001$	$\chi^2 = 5.812^c$ $P = 0.214$	$\chi^2 = 7.754^c$ $P = 0.101$

a: One-way ANOVA was applied, b: Tukey test was applied, c: Kruskal–Wallis test was applied because of heterogeneity

Table 3: Comparison of patients' religious and cultural rituals and N-SAS points ($n = 352$)

Religious and cultural rituals	<i>n</i>	N-SAS points			
		PhWB Mean ± SD	SoWB Mean ± SD	PsWB Mean ± SD	General well-being Mean ± SD
Any complementary therapy					
Yes	128	0.068±0.03	0.019±0.01	0.118±0.25	0.206±0.26
No	224	0.063±0.03	0.017±0.01	0.113±0.25	0.194±0.25
		$t=1.526^a$ $P=0.128$	$t=1.575^a$ $P=0.116$	$Z=0.735^c$ $P=0.462$	$Z=1.439^c$ $P=0.150$
Blessings/prayers					
Yes	321	0.066±0.03	0.018±0.01	0.116±0.25	0.200±0.26
No	31	0.059±0.03	0.013±0.01	0.102±0.24	0.175±0.24
		$t=1.124^a$ $P=0.262$	$t=1.688^a$ $P=0.092$	$t=0.300^a$ $P=0.765$	$t=0.531^a$ $P=0.595$
Vow/sacrifice					
Yes	80	0.063±0.03	0.021±0.01	0.135±0.29	0.220±0.29
No	272	0.066±0.03	0.017±0.01	0.109±0.24	0.192±0.24
		$t=0.692^a$ $P=0.490$	$t=2.370^a$ $P=0.018$	$t=0.796^a$ $P=0.427$	$t=0.841^a$ $P=0.401$
Consult local herbalist					
Yes	56	0.066±0.03	0.021±0.01	0.159±0.32	0.246±0.32
No	296	0.065±0.03	0.017±0.01	0.106±0.24	0.189±0.24
		$t=0.218^a$ $P=0.828$	$t=1.677^a$ $P=0.094$	$Z=0.125^b$ $P=0.900$	$Z=1.059^b$ $P=0.290$
Lead pouring					
Yes	13	0.088±0.02	0.029±0.01	0.116±0.26	0.235±0.24
No	339	0.064±0.03	0.017±0.01	0.115±0.25	0.197±0.25
		$t=2.735$ $P=0.007$	$t=2.964$ $P=0.003$	$Z=0.125^b$ $P=0.900$	$Z=1.059^b$ $P=0.290$
Consult religion person/Hodja					
Yes	7	0.069±0.04	0.025±0.01	0.034±0.02	0.129±0.06
No	345	0.065±0.03	0.017±0.01	0.116±0.25	0.200±0.26
		$t=0.299^b$ $P=0.765$	$t=1.355$ $P=0.176$	$t=0.836$ $P=0.404$	$t=0.715$ $P=0.475$
Visit Ocak ^c					
Yes	5	0.091±0.03	0.019±0.004	0.028±0.03	0.139±0.04
No	347	0.065±0.03	0.018±0.01	0.116±0.25	0.199±0.26
		$t=1.865^b$ $P=0.063$	$t=0.201^b$ $P=0.841$	$t=0.758^b$ $P=0.449$	$t=0.514^b$ $P=0.608$
Visit tomb					
Yes	23	0.072±0.03	0.025±0.01	0.043±0.02	0.141±0.51
No	329	0.025±0.01	0.017±0.01	0.120±0.26	0.202±0.26
		$t=1.050^a$ $P=0.295$	$t=2.363^a$ $P=0.019$	$Z=0.316^b$ $P=0.752$	$Z=0.617^b$ $P=0.537$
Amulet					
Yes	6	0.075±0.04	0.019±0.01	0.188±0.39	0.283±0.38
No	346	0.065±0.03	0.018±0.01	0.113±0.25	0.197±0.25
		$t=0.769^a$ $P=0.442$	$t=0.236^a$ $P=0.814$	$t=0.704^a$ $P=0.482$	$t=0.806^a$ $P=0.421$
Drink holy waters (zem zem)					
Yes	48	0.069±0.03	0.020±0.01	0.059±0.14	0.148±0.14
No	304	0.064±0.03	0.017±0.01	0.124±0.26	0.206±0.27
		$t=0.881^a$ $P=0.379$	$t=1.184^a$ $P=0.237$	$Z=1.453^b$ $P=0.146$	$Z=0.632^b$ $P=0.527$
Charm					
Yes	9	0.084±0.02	0.035±0.01	0.128±0.32	0.248±0.31
No	343	0.065±0.03	0.017±0.01	0.114±0.25	0.197±0.25
		$t=1.881^a$ $P=0.061$	$t=3.582^a$ $P=0.0001$	$t=0.158^a$ $P=0.875$	$t=0.589^a$ $P=0.556$

a: Student's *t* test was applied, b: Mann–Whitney U was applied because of heterogeneity, c: Folk physician

Table 4: Linear regression between quality of life and gender

Gender	Factors	B	95% CI for exp (β)		t	P
			Lower	Upper		
Physical well-being						
Female (n=193)						
	7 th chemotherapy	0.004	0.001	0.007	2.514	0.013
	Temporary job	-0.024	-0.045	-0.004	-2.385	0.018
Male (n=159)						
	6 th chemotherapy	0.015	0.003	0.028	2.396	0.018
Social well-being						
Female (n=193)						
	Fluorouracil-based therapy	-0.009	-0.013	-0.004	-3.728	0.0001
	2 nd chemotherapy	-0.007	-0.012	-0.002	-2.998	0.003
	Urinary cancer	-0.016	-0.027	-0.004	-2.679	0.008
Male (n=159)						
	2 nd chemotherapy	-0.008	-0.012	-0.004	-4.274	0.0001
	Urinary cancer	0.008	0.002	0.013	2.818	0.005
	Student	0.020	0.009	0.031	3.623	0.0001
	Taxane-based therapy	0.006	0.0001	0.012	1.912	0.058
	Lymphoma	0.007	0.000	0.014	2.007	0.047
Psychological well-being						
Female (n=193)						
	Single	0.418	0.339	0.497	10.425	0.0001
	Retired	-0.192	-0.348	-0.036	-2.421	0.016
	Farmer	-0.475	-0.911	-0.039	-2.147	0.033
Male (n=159)						
	Married	-0.548	-0.637	-0.459	12.140	0.0001
	Sarcoma	-0.255	-0.398	0.113	-3.532	0.001
	Student	-0.281	-0.468	-0.094	-2.963	0.004
General well-being						
Female (n=193)						
	Married	0.412	-0.494	-0.331	10.015	0.0001
	Retired	-0.180	-0.340	-0.019	-2.212	0.028
	Farmer	-0.491	0.939	-0.044	-2.166	0.032
	Multiple myeloma	-0.174	0.344	-0.004	-2.018	0.045
Male (n=159)						
	Married	0.526	0.435	0.617	11.405	0.0001
	Sarcoma	-0.235	-0.381	-0.089	-3.178	0.002
	Student	-0.224	-0.415	-0.033	-2.315	0.022

PhWB; fluorouracil therapy, 2nd chemotherapy and urinary cancer enhanced SoWB; and retired patients and farmers and those with multiple myeloma had improved general well-being and, therefore, better quality of life [Table 4]. In men, 6th cure of chemotherapy worsened SoWB; urinary cancer, student, taxane cure and lymphoma worsened SoWB; and singleness worsened general well-being and, therefore, quality of life. Furthermore, 2nd chemotherapy worsened SoWB; married, sarcoma and studentship

worsened PsWB; and sarcoma and studentship improved general well-being, and therefore, quality of life [Table 4].

Discussion

We found that women had worse PhWB and SoWB than men. Gender did not affect PsWB and quality of life ($P > 0.05$) [Tables 1 and 4]. The reason why women had lower PhWB and SoWB might be because of their physical weakness and delicacy. Some previous studies reported that woman had lower physical, social^[27] and psychological^[28,29] life qualities while Güner *et al.*^[30] stated, on the contrary, that men had lower quality of life. Meantime, in some studies, gender did not affect the quality of life of the patients.^[31-34]

Single patients in this study had worse PsWB and general well-being than married ones. Marital status did not affect PhWB and SoWB [Tables 1 and 4]. Previous studies indicated that married patients had higher quality of life and more family/friends.^[11,35] Armstrong *et al.*^[31] and Lis *et al.*^[33] indicated, on the other hand, that marital status did not influence quality of life, but that social support improved the quality of life.^[10] General well-being of married patients' might be because of their higher social supports than those of single ones'.

Education in our study did not affect the quality of life of the patients [Table 1]. Lis *et al.*^[33] and Yıldız *et al.*^[34] reported the same results. Knight *et al.*^[36] found that lower education levels in urinary cancer patients had worse physical, social and role functions and experienced more side-effects. Can *et al.*^[27] observed that university graduates had higher life levels than others. Güner *et al.*^[30] similarly reported that the quality of life worsened when the education level was low.

Housewives had worse PhWB and SoWB than labors and clerks [Table 1]. Can *et al.*^[37] also reported that housewives had worse PsWB, PhWB and SoWB than other occupations. Timperi *et al.*^[12] similarly found that working women with breast cancer had better PhWB, SoWB and PsWB. Those previous studies supported our findings. The lower life levels of housewives might be because of their distance from social life and their lesser social support. Government clerks had worse PsWB and general well-being than other professions [Table 1]. The lower life levels of clerks might be because of their odd life perception.

We found that patients with operation, radiotherapy and chemotherapy had worse SoWB than those with chemotherapy or operation + chemotherapy. Therapy did not affect PhWB, PsWB and general well-being. Higher

number of chemotherapies lowered the quality of life [Tables 2 and 4]. Similarly, Işıkhah *et al.*^[38] did not find any relationship between disease period and quality of life ($n = 508$). On the other hand, Arslan and Bölükbaşı^[35] reported that operated patients had better life qualities. Can *et al.*^[37] stated that later diagnosis lowered the quality of life. Similarly, Kwan *et al.*^[39] indicated that increased therapy time decreased the quality of life and worsened physical and social functions. Longer medical therapy inhibits social life whereas diverse therapy types increase unwanted symptoms and, therefore, decreases energy and desire and, finally, lower SoWB. Therefore, it is most likely expected that operation, radiotherapy and chemotherapy worsen SoWB.

There was a relationship between medical diagnosis of patients and SoWB. Breast cancer patients had the worst SoWB. The other three cancers with worse SoWB were head-neck, sarcoma and gynecologic cancers. Colorectal cancer patients had the best SoWB. Cancer types in our study did not affect PhWB, PsWB and general well-being [Tables 2 and 4]. Can *et al.*^[27] found that patients with breast, gynecologic and soft tissue cancers had worse SoWBs. Lis *et al.*^[33] found that colorectal cancer patients had the best quality of life while lung cancer patients had the worst. Breast cancer patients were highly depressed^[3] and, therefore, experienced worsened social relationships, changes in role performances and lowered life qualities.^[4] Side-effects because of breast cancer caused hair loss, changed the body image, decreased sexual functions and libido and lowered social life quality due to early menopause.^[5] Head-neck and sarcoma patients might have been affected by worsened body changes by the diseases and gynecologic cancer patients had negative effects on the role of women.

Taxane-based therapy induced statistically worse SoWB than those taking platinum- and doxorubicin- and fluorouracil-based therapies [Tables 2 and 4]. Can *et al.*^[27] similarly found that taxane-based patients had worse SoWB than those taking platinum-, doxorubicin- and fluorouracil-based therapies. Taxane induced hair losses in 80% of the patients.^[40] Patients had worse life qualities after 6 months of paclitaxel and platinum therapy, but not from lower doses of etoposide and cisplatin.^[41]

Complementary therapy did not affect patients' quality of life [Table 3]. Previous studies indicated, however, that complementary therapy had influenced patients' quality of life. Lis *et al.*^[33] determined that nutrition supplements did not affect life quality in lung cancers, induced better life quality in colorectal cancer and higher PhWB and

PsWB in breast cancers. Armstrong *et al.*^[31] reported that complementary therapy did not affect the quality of life, while Wyatt *et al.*^[42] added that lower quality-of-life patients had practiced more of complementary therapies. Hlubocky *et al.*^[43] pronounced that patients practiced complementary therapy had lower points for all life quality parameters (social, physical, psychological and general). Sawada *et al.*^[44] found that acupuncture during chemotherapy induced a better quality of life in patients.

Blessings/prayers, vow and sacrifice, consulting local herbalists, religious people — hodja and “ocak,” amulet use and drinking holy waters did not affect the quality of life of the patients [Table 3]. However, religious belief/behaviors of black Americans affected their ability to overcome anxiety^[45] and blessings, first by women and then by the elderly in both genders eased the disease.^[45,46]

Tomb visit worsened SoWB in patients and did not affect PhWB, PsWB and quality of life [Table 3]. Lead pouring patients had worse PhWB and SoWB, while lead pouring did not affect PsWB and quality of life. Amulet practice caused worse SoWB, but did not affect PhWB, PsWB and quality of life [Table 3]. Interestingly, Kishore *et al.*^[47] found that 60% of patients considered amulet as one of the causes of cancer. Amulet practice might be because of patients' perception that cancer was caused by a bad eye. Patients with bad SoWB might be trying one possible “therapy” after other to just expect a “benefit.”

Cultural and religious rituals^[15] were common among depressed women; 35% of patients consulted religious men for depression (Pir/Faqır), 27% believed in therapy of religious men and/or used amulets (15.3%) and 12% of the patients consumed holy water and plants. Cancer patients had more religious practices than non-cancer individuals, and these practices decreased depression symptoms.^[14] African-American patients with breast cancer ($n = 147$), who depended on God for their problems and believed that cure and the disease were desires of God had less worries.^[48] Religion might have affected individuals' quality of life under these disease conditions.

Can *et al.*^[27] told that patients practicing more religious rituals were of lower life quality and had more psychological and social problems. Hamilton *et al.*^[49] determined that patients who practiced religious ritual levels of perceived control about illness were higher. Similarly, Tarakeshwar *et al.*^[18] stated that patients positive for religion had better quality of life than those negative for the same.

Limitations

This study was a restricted one because it was cross-sectional in nature and was applied in one center; therefore, the results could only be applied in the population studied in this center.

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