

The Experience of Fatigue in Turkish Patients Receiving Chemotherapy

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Purpose/Objectives: To determine the experience of fatigue in Turkish patients receiving chemotherapy.

Design: Descriptive.

Setting: Outpatient unit in a large university hospital in Ankara, Turkey.

Sample: 100 patients randomly chosen from those who were undergoing chemotherapy at the outpatient unit.

Methods: Data were collected using a personal information form developed by the investigator and a visual analog scale for fatigue.

Main Research Variables: Measures taken by patients to cope with fatigue, fatigue experienced by individuals affecting their daily activities, age and gender, disease and treatment factors, and symptoms related to the chemotherapy.

Findings: The majority of patients (86%) experienced fatigue, and 73% stated that they coped with fatigue by decreasing their activities and resting more. Age was not a statistically significant factor affecting the level of fatigue, but gender was found to have an effect. Length of illness, number of chemotherapy courses, and the patients' symptoms affected level of fatigue.

Conclusions: The majority of patients experienced fatigue, and most of the measures used to cope with fatigue were not effective. Fatigue affected patients' daily activities.

Implications for Nursing: A need exists for more and better interventions to help patients cope with chemotherapy-related fatigue.

Key Points . . .

- ▶ Fatigue is a subjective and multidimensional concept that has affective, physical, cognitive effects on individuals.
- ▶ Individuals must be able to cope with fatigue that negatively affects the entirety of their being.
- ▶ Various practices have proved to be beneficial in combating cancer-related fatigue, including exercising, effectively managing stress, and using distraction.
- ▶ Nurses should be educated about fatigue and work closely with patients in using strategies to help them cope with the condition.

and ability to cope with the illness and endure the problems that arise with treatment (Curt, 2000). Fatigue also can affect individuals' economic status. In their study of fatigue in a population of patients with cancer, Curt et al. (2000) identified that 75% of employed patients altered their employment status, 28% discontinued work indefinitely, 23% went on disability, and 11% used unpaid medical or family leave.

Fatigue also affects patients' self-care activities and daily life (Meyerowitz, Sparks, & Spears, 1979). A large percentage of women receiving chemotherapy have been shown to be affected by fatigue in regard to their general activities, bathing, dressing, normal work activities, ability to concentrate, relationships with others, enjoyment of life, and moods (Jacobsen et al., 1999). Cancer-related fatigue negatively affects the biopsychosocial dimensions of individuals. However, a scientific base has yet to be defined because the complete mechanism involved in these factors is not known (Andrews & Morrow, 2001; Gutstein, 2001). Ream and Richardson (1996), using concept analysis, defined fatigue as "a subjective and unpleasant symptom that incorporates total body feelings ranging from tiredness to exhaustion creating an unrelenting overall condition that interferes with the individual's ability to function to their normal capacity" (p. 527).

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Fatigue is the most common symptom associated with cancer and its treatment (Curt, 2000; Curt et al., 2000; Ekfors & Petersson, 2004; Glaus, Crow, & Hammond, 1996; Lesage & Portenoy, 2002; Mock et al., 2000; Porock & Juenger, 2004). Research has shown that 70%–90% of patients with cancer and 82%–100% of patients receiving chemotherapy experience fatigue (Jacobsen et al., 1999; Maughan et al., 2002; Sitzia & Dikken, 1997; Sitzia & Huggins, 1998; Stone et al., 2000). Also, 30%–75% of patients continue to experience fatigue months and years after finishing treatment (Bower et al., 2000; Broeckel, Jacobsen, Horton, Balducci, & Lyman, 1998; Cella, Davis, Breitbart, Curt, & Fatigue Coalition, 2001), and fatigue negatively affects quality of life (Ahlberg, Ekman, Gaston-Johansson, & Mock, 2003; Donovan & Ward, 2005; El-Banna et al., 2004; Lindqvist, Widmark, & Rasmussen, 2004; Mock, 2001; Ream, Browne, Glaus, Knipping, & Frei, 2003).

Fatigue is a subjective and multidimensional concept that has physical, cognitive, and affective effects on individuals. It also can affect patients' state of wellness, ability to perform activities of daily living, relationships with family and friends,

Quick Facts: Turkey

Geography, history, and political organization: Three percent of the total area lies in southeastern Europe, and the remainder is in southwestern Asia. The total area is 780,580 km², slightly larger than the size of Texas.

Social and cultural features: Turkey has a highly heterogeneous social and cultural structure, with sharp contrasts among population groups. The modern and traditional exist simultaneously within the society. Family ties are strong and influence the formation of values, attitudes, aspirations, and goals.

Economy: Turkey can be classified as a middle-income country. The rate of economic growth has been comparatively high in recent years, and the economy has undergone a radical transformation from an agricultural base to an industrial one, particularly since the 1980s.

Population: Turkey is the most populous country of the Middle East. The population was 72 million in 2005 and is expected to reach 76 million by 2010 and 88 million by 2025. Approximately 35% of the total population live in rural areas. Twenty-six percent of the total population are younger than age 15; only 7% are older than age 65.

Healthcare system priorities and programs: The Ministry of Health is officially responsible for designing and implementing nationwide health policies and delivering healthcare services. The Ministry also regulates prices of medical drugs and controls drug production and the operation of pharmacies. Health institutions that provide medical care and preventive health services include inpatient institutions (hospitals and health centers) and outpatient institutions (health units, health houses, infirmaries, mother and child health centers, and dispensaries). Services provided by the institutions include personal health cards, which are sent to the Ministry monthly together with information on health status. Mean life expectancy in women and men is 74.0 years and 69.1 years, respectively, with an overall mean of 71.5 years.

Education: Formal education includes preschool, primary school, secondary school, and higher education institutions. Eighty-seven percent of the population are literate.

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Although all of the factors that cause cancer-related fatigue are not known, many factors are believed to play a part. The relationships among demographic, medical, and psychologic factors have been investigated in regard to cancer-related fatigue. Most of these studies have not found a relationship between fatigue and gender (Akechi, Kugaya, Okamura, Yamawaki, & Uchitomi, 1999; Knobel et al., 2001; Loge, Abrahamsen, Ekeberg, & Kaasa, 2000; Okuyama et al., 2001; Servaes, van der Werf, Prins, Verhagen, & Bleijenberg, 2000; Servaes, Verhagen, Schreuder, Veth, & Bleijenberg, 2003; So & Tai, 2005), age (Barstch, Weis, & Moser, 2003; Broeckel et al., 1998; Hann et al., 1997; Knobel et al.; Okuyama et al., 2001; Servaes et al., 2003; Smets et al., 1998), marital status (Broeckel et al.; Hann et al., 1997; Okuyama et al., 2001), ethnicity (Broeckel et al.), educational level (Akechi et al.; Broeckel et al.; Hann et al., 1997; Knobel et al.; Okuyama et al., 2001; Servaes et al., 2000, 2003; Smets et al.), income (Hann et al., 1997), employment status (Akechi et al.; Broeckel et al.; Okuyama et al., 2001), and number of individuals living together (Akechi et al.). In contrast, some

studies have shown that fatigue is associated with gender (Smets et al.) and age (Fossa, Dahl, & Loge, 2003; Loge et al., 2000; Okuyama et al., 2000; So, Dodgson, & Tai, 2003; So & Tai; Woo, Dibble, Piper, Keating, & Weiss, 1998). As the research demonstrates, no clear results are apparent regarding the relationship between demographic variables and cancer-related fatigue.

A relationship has been shown to exist between fatigue and the physical factors of appetite, weight, performance status, and tumor site (Akechi et al., 1999; Morant, Stiefel, Berchtold, Radziwill, & Riesen, 1993; Pater, Zee, Palmer, Johnston, & Osoba, 1997). Patients with lung cancer experience severe fatigue (Holzner et al., 2002; Smets et al., 1998), and patients with ovarian cancer experience more fatigue than patients with breast cancer (Payne, 2002). However, other studies have not shown a relationship between tumor site and fatigue (Barstch et al., 2003; Dimeo et al., 2004; Howell, Radford, Smets, & Shalet, 2000; Servaes et al., 2000, 2003; Smets et al.). Richardson, Ream, and Wilson-Barnett (1998) reported that a relationship exists between fatigue and type of cancer treatment, low level of red blood cells, sleep disorders, stress, poor nutrition, and inactivity. Hwang, Chang, Cogswell, and Kasimis (2002) reported a relationship between fatigue and the symptoms it creates and poor quality of life. Most studies have not shown a relationship between tumor stage and fatigue (Donovan et al., 2004; Haghghat, Akbari, Holakouei, Rahimi, & Montazeri, 2003; Hann et al., 1999; Jacobsen et al., 1999; Stone et al., 2000; Wratten et al., 2004). However, some studies have reported that a relationship exists between tumor stage and severity of fatigue (Can, Durna, & Aydiner, 2004; Hwang et al.; Mills, Parker, Dimsdale, Sadler, & Ancoli-Israel, 2005). In the studies that have examined the relationship between duration of illness and fatigue, no relationship was found (Broeckel et al., 1998; Hann et al., 1997; Loge et al., 1999; Okuyama et al., 2001; Servaes et al., 2003).

In some studies, a relationship has been reported between fatigue and the chemotherapy medication regime (de Jong, Candel, Schouten, Abu-Saad, & Courtens, 2004; Shun et al., 2005) and long-term treatment (de Jong et al., 2004, 2005). However, Loge et al. (1999) and Howell et al. (2000) found no relationship between fatigue and chemotherapy regimen, and Broeckel et al. (1998), Servaes et al. (2000), and Servaes, Verhagen, and Bleijenberg (2002) found no differences in fatigue based on length of treatment.

Some studies have shown a relationship between fatigue and certain chemotherapy symptoms. For example, relationships have been shown to exist between fatigue and nausea and vomiting (Ahlberg, Ekman, & Gaston-Johansson, 2005; Stone, Richards, A'Hern, & Hardy, 2001), loss of appetite (Ahlberg et al., 2005), and diarrhea (Ahlberg et al., 2005; Holzner et al., 2002; Stone et al., 2001). Studies also have reported a relationship between fatigue and quality of sleep (Berger & Higginbotham, 2000; Holzner et al., 2002; Jacobsen et al., 1999) and the severity of fatigue and the level of complaints created by symptoms (Berger & Higginbotham; Can et al., 2004; Hwang et al., 2002; Jacobsen et al.; Shun et al., 2005). Obviously, making a clear statement about the factors responsible for fatigue is difficult.

Individuals must be able to cope with fatigue that negatively affects the entirety of their being. Various practices have proved to be beneficial in combating cancer-related fatigue,

including exercising, effectively managing stress, using distraction, problem solving (Ream et al., 2003), optimizing nutritional fluid and electrolyte balance, improving sleep, maintaining proper hygiene, and using restorative therapy (e.g., gardening, quiet time, meditation) (Mock & Olsen, 2003). Also, Ream et al. (2003) and Ream, Richardson, and Alexander-Dann (2002) determined that education and support in managing fatigue enabled individuals to cope better. It is becoming more important for nurses and other healthcare personnel to be able to guide and support patients with cancer as they try to cope effectively with fatigue.

The current study was conducted to determine the incidence, percentage, and factors that affect fatigue in Turkish patients who are undergoing chemotherapy. As part of this evaluation, the goal was to answer the following questions.

- What is the incidence of fatigue, and does it change in severity during the day?
- Do the personal characteristics of age and gender affect the fatigue status?
- Do factors related to the disease and treatment, including length of illness, disease stage, treatment regimen, number of chemotherapy courses, and symptoms related to the chemotherapy, affect the level of fatigue?
- How does fatigue affect daily activities?
- What measures are taken by patients to cope with fatigue?

Methods

Setting and Participants

This descriptive study was conducted in the outpatient unit of the oncology institute at a large university hospital in Ankara, Turkey. The study excluded patients who were younger than 18 years of age, were used in the validity and reliability study for the main study instrument, could not read or write Turkish, had difficulty seeing or hearing, could not use their dominant hand (because their arm was immobilized during chemotherapy infusion and they could not write or mark the instruments), were receiving chemotherapy for the first time, or had metastases, cognitive impairment, or a known history of psychiatric disorders, neurologic impairments, or muscular dystrophies.

Instruments

A **personal information form** developed by the investigator was used to collect information about age, gender, and factors related to the illness and treatment, including diagnosis, stage at diagnosis, drug regime, length of illness, number of chemotherapy courses, and symptoms related to the chemotherapy. It included open-ended questions designed to ascertain the patients' subjective feeling of fatigue, fatigue level during the day, the effect of fatigue on daily activities, and methods used to prevent fatigue. On the form, the patients classified their level of ability to perform daily activities (i.e., climb stairs, descend stairs, take a bath, walk at moderate speed, walk slowly, get dressed or undressed, stand comfortably, converse, use the toilet, do housework, eat food, easily read or write, and categorize raising and carrying an object weighing more than 5 kg as "comfortably," "with effort," "with help," or "unable").

The **Visual Analogue Scale for Fatigue (VASF)** is an 18-item scale measuring fatigue and energy using a 100 mm line anchored by positive and negative statements (Lee, Hicks, & Murcia, 1991). A high score on the fatigue subscale and a

low score on the energy subscale indicate an excessive level of fatigue. Because the scoring interval for the VASF has not been predetermined, it is believed to be more sensitive than instruments with set scoring intervals. Additionally, the scale was preferable because it is brief and easy to use and understand.

The scale's validity-reliability study was conducted for the first time in 1999 in Turkey with patients undergoing hemodialysis (Yurtsever & Beduk, 2003). For the present study, the scale was completed by a control group composed of 50 healthy individuals older than 18 years of age and 50 randomly selected patients receiving chemotherapy. The fatigue and energy subscale means of the patients were compared with those of the control group. A statistically significant difference was found between the two groups for the fatigue and energy subscales ($t = 3.42, p < 0.001$; $t = 2.57, p < 0.001$).

Procedures

Prior to beginning the research, the study's goals, method, and forms were explained to the oncology institute review board, which then granted written permission to conduct the study. The patients included in the study also were told about the purpose of the research, asked if they would like to participate, and told that they could withdraw their permission at any time. Their informed consent then was obtained. The data were collected over a six-month period by the investigator through interviews with the patients. The patients were interviewed during their chemotherapy treatment. Every interview lasted approximately 30–45 minutes.

Data coding and evaluation procedures were conducted using the SPSS® (SPSS Inc.) computer program with mean, *t* tests, one-way analysis of variance (ANOVA), Pearson correlations, and Cronbach α internal consistency test. The mean of the patients' VASF fatigue and energy scores was determined, and *t* tests and ANOVA were used to determine whether a difference between the means existed. Included within the scale's validity and reliability, the correlation of all of the subscale items were compared with each other and the fatigue and energy subscale items comparative correlation was examined.

Results

One hundred patients undergoing outpatient chemotherapy voluntarily participated. The descriptive characteristics of the participants appear in Table 1, and their drug treatment regimens are presented in Table 2. The mean age for the patients in the research sample was 50.1 years, and 60% of the patients were female. For 73% of the patients, the first diagnosis of their illness had been made within the last year. Sixty-six percent of the patients had been receiving chemotherapy for six months, and 46% were undergoing at least their fourth session of chemotherapy. The most common symptoms experienced by patients together with their chemotherapy were nausea and vomiting (72%), loss of appetite (60%), insomnia (69%), pain (46%), indigestion (39%), and stomatitis (30%).

The majority of the patients (86%) experienced fatigue, which was described as light for 14%, moderate for 41%, and severe for 31%. Patients stated that their fatigue did not change throughout the day. The patients' VASF subscale mean fatigue score was 5.54; the score was 4.09 for the energy subscale.

Table 1. Patient Demographics

Characteristic	n
Age (years)	
18–30	22
31–40	17
41–50	43
51+	18
Gender	
Female	60
Male	40
Diagnosis	
Breast cancer	21
Lung cancer	6
Colorectal cancer	11
Nasopharyngeal cancer	5
Liver cancer	2
Ovary cancer	10
Cervix cancer	2
Prostate cancer	8
Hodgkin disease	9
Non-Hodgkin lymphoma	7
Acute lymphoblastic leukemia	8
Acute myeloid leukemia	11
Stage	
I	19
II	32
III	28
IV	21
Length of illness (years)	
< 1	73
1–3	17
4–6	4
7+	6
Course number	
1	18
2	19
3	17
4+	46

N = 100

The age of the patients did not have an effect on their level of fatigue or energy. The fatigue subscale mean scores of the female patients in the sample were higher than those of the male patients ($t = 1.50, p < 0.05$), and their energy subscale mean scores were lower ($t = -1.94, p < 0.05$).

Fatigue and Disease and Treatment Factors

The diagnosis, tumor stage, and drug regimen did not affect the patients' level of fatigue. An examination of the distribution of mean fatigue scores according to the length of illness for the patients in the sample showed that the mean fatigue scores for those with a length of illness from 0–12 months was higher than for those with a longer length of illness ($F = 0.34, p < 0.05$) and that their energy mean scores were lower ($F = -0.48, p < 0.05$). When the mean fatigue scores were examined according to the number of chemotherapy sessions, patients in the third session had statistically significant higher mean fatigue scores ($F = 1.14, p < 0.05$) and lower mean energy scores ($F = 1.14, p < 0.05$).

As the frequency of patient symptoms increased, the mean fatigue score also increased and the mean energy score decreased. Patients who complained about extreme lack of

appetite ($n = 18$) had a higher fatigue mean score ($\bar{X} = 5.41, F = 1.14, p < 0.05$) and a lower energy mean score ($\bar{X} = 3.48, F = 2.15, p < 0.05$) than those without loss of appetite ($n = 61$) or with occasional loss of appetite ($n = 21$). Similarly, patients experiencing severe nausea and vomiting ($n = 51$) had a higher fatigue mean score ($\bar{X} = 5.59, F = 2.28, p < 0.05$) and a lower energy mean score ($\bar{X} = 3.51, F = 1.73, p < 0.05$) than those without nausea and vomiting ($n = 28$) or those experiencing only occasional nausea and vomiting ($n = 21$). Patients who frequently experienced stomatitis ($n = 18$) had a higher fatigue mean score ($\bar{X} = 7.00$) and a lower energy mean score ($\bar{X} = 1.91$) than those patients who rarely ($n = 12$) or never ($n = 70$) experienced stomatitis ($t[\text{fatigue}] = -0.48, p < 0.05; t[\text{energy}] = 0.80, p < 0.05$). Patients who had frequent indigestion ($n = 22$) had a significantly higher fatigue mean score ($\bar{X} = 6.27, F = 3.33, p < 0.05$) and a lower energy mean score ($\bar{X} = 3.18, F = 1.95, p < 0.05$) than those who occasionally ($n = 17$) or never ($n = 61$) experienced this problem. In addition, patients who complained of frequent problems with sleep ($n = 50$) had a higher fatigue mean score ($\bar{X} = 6.37$) and a lower energy mean score ($\bar{X} = 2.89$) than those who occasionally ($n = 19$) or never ($n = 31$) had this problem ($F = 7.21, p < 0.05$ and $F = 5.28, p < 0.05$, respectively).

In regard to the effects of fatigue, the patients were able, with difficulty, to climb stairs (60%), descend stairs (50%), walk at moderate speed (61%), walk slowly (35%), and stand comfortably (78%), but they were not able to comfortably read or write (66%), raise and carry an object weighing more than 5 kg (58%), or do housework (54%) (see Table 3).

Measures Taken to Cope With Fatigue

Patients who were found to have experienced fatigue were asked what measures they used to cope with it. Seventy-three percent stated that they decreased their activities and rested. In addition to resting, other measures used included taking

Table 2. Drug Regimens Used

Drug Regimen	n
CEF (adjuvant)	9
CMF (adjuvant)	5
Taxane	7
Taxane + gemcitabine	3
Cisplatin + vinorelbine	4
5FU + leucovorin (adjuvant)	7
Carbo + taxane	7
Carbo + topo + taxane	6
5FU	7
Carbo + eto + vincristine	4
Cisplatin + taxane	4
ABVD	8
M-AMSA + eto + Ara-C	8
Capecitabine + taxane + carbo	6
5FU + taxane	6
Ifosfamide + eto + vincristine + doxorubicin	5
Capecitabine + taxane	4

N = 100

ABVD—doxorubicin, bleomycin, vinblastine, dacarbazine; Ara-C—cytosine arabinoside; carbo—carboplatin; CEF—cyclophosphamide, epirubicin, 5-fluorouracil; CMF—cyclophosphamide, methotrexate, 5-fluorouracil; eto—etoposide; 5FU—5-fluorouracil; M-AMSA—amsacrine; topo—topotecan

Table 3. Patients' Ability to Perform Daily Activities

Activity	Status of Performing Activities			
	Comfortably	With Effort	With Help	Unable
Climb stairs	33	60	4	3
Descend stairs	43	50	4	3
Take a bath	76	7	17	—
Walk at moderate speed	28	61	9	2
Walk slowly	56	35	7	2
Get dressed or undressed	78	19	3	—
Stand comfortably	7	78	8	7
Converse	71	29	—	—
Able to use toilet	93	7	—	—
Able to do housework	6	21	19	54
Eating food	97	3	—	—
Easily read or write	21	13	—	66
Raise and carry an object weighing more than 5 kg	2	6	34	58

N = 100

care with their nutrition (12%), exercising (5%), reading a book or newspaper (3%), listening to music (3%), drinking lots of fluids (3%), watching television (3%), trying to cope with the pain (3%), and massage (3%). When the patients used these measures, 26% stated that the measures were “partially effective” in decreasing their fatigue and 37% stated that they were “ineffective.”

Discussion

The majority of the patients in the study experienced fatigue, and this fatigue was primarily at the moderate level. Similarly, Blesch et al. (1991) reported that two-thirds of patients with cancer receiving chemotherapy and radiation therapy experienced a moderate or severe level of fatigue. The level of fatigue of the patients in the present study did not change throughout the day. Glaus (1993) reported that patients' level of fatigue is high throughout the day and decreases in the evening. However, other studies have shown that patients' level of fatigue changes throughout the day, with increases particularly in the afternoon and early evening (Molassiotis & Chan, 2001; Richardson et al., 1998). The change in patients' level of fatigue throughout the day may be affected by patients' methods of coping with fatigue and by the support they receive from other family members.

Age was not found to have an effect on the level of fatigue. Varying results have been obtained from other studies about the relationship between age and fatigue. In regard to patients with testicular cancer (Servaes et al., 2003) or hematologic malignancy (Barstch et al., 2003; So & Tai, 2005), the older the subject, the more fatigue reported, whereas younger patients with breast cancer reported more fatigue in a study by Woo et al. (1998).

The mean fatigue subscale for the female patients in the sample was higher than that for the male patients, and their energy mean score also was lower. Glaus (1993) reported that female patients receiving chemotherapy experience more fatigue. Molassiotis and Chan (2001) reported a higher level of fatigue for female Chinese patients receiving chemotherapy than for male patients. This result is consistent with the

findings of the present study. However, the data of the present study are in contrast with other studies (Akechi et al., 1999; Knobel et al., 2001; Loge et al., 2000; Okuyama et al., 2001; Servaes et al., 2000, 2003; So & Tai, 2005).

Among the reasons why the percentage of fatigue in female patients may be more severe than in male patients is that, in the Turkish culture, women can talk more easily than men about their illness and the problems associated with it. In Turkish society, men perceive the ill state as a loss of their power. For this reason, men may avoid talking about the problems they experience. In addition, in Turkish society, the responsibilities of women within the home are more than those of men, which may be another reason why their fatigue level is higher than men's. Another factor may be the fact that the majority of the women in the study had breast or ovarian cancer, and their treatment regime may have affected their fatigue level.

The mean fatigue scores for patients with a length of illness from 0–12 months was higher than for those with a longer length of illness, and their energy mean scores were lower. Similarly, So et al. (2003) reported that patients who have been diagnosed recently with a hematologic malignancy experience more fatigue than other patients. In contrast to the data of the present study, Ream and Richardson (1997) found that as the stage of illness increased, the level of fatigue also increased. Newly diagnosed patients may experience more fatigue because the process of accepting their illness was incomplete and because they have not yet developed means of coping with the symptoms associated with chemotherapy.

When the mean fatigue scores were examined in relation to the number of chemotherapy courses, patients receiving their third course had higher mean fatigue scores and lower mean energy scores. Significant increases in fatigue have been reported in longitudinal studies throughout the course of chemotherapy (Donovan et al., 2004; Kumar et al., 2004; Mills et al., 2005; Shun et al., 2005). Other studies have reported no increase or pattern in fatigue scores across measurement points (Prue, Rankin, Allen, Gracey, & Cramp, 2005). Berger (1998) evaluated fatigue during the first three courses of adjuvant chemotherapy in patients with breast cancer and reported that the level of fatigue did not change 48 hours after each treatment. Jacobsen et al. (1999) determined that patients with breast cancer experienced a worsening of their fatigue following the initiation of chemotherapy. This situation needs further research to determine whether the worsening fatigue is related to the chemotherapy or advancement of the disease. In addition, the presence of other symptoms that are not yet under control may be the cause of patients experiencing more fatigue in the third course.

As the frequency of patients' symptoms related to chemotherapy increased, the mean fatigue score also increased and the mean energy score decreased. Loss of appetite, nausea and vomiting, stomatitis, and indigestion also are known to have a negative effect on individuals' nutritional status, and the addition of inadequate digestion and cachexia affect the level of fatigue. Appetite loss also was linked to fatigue in patients with breast cancer (Okuyama et al., 2000) and lung cancer (Okuyama et al., 2001). An association between fatigue and the presence of nausea and vomiting has been reported (Ahlberg et al., 2005; Stone et al., 2001). The findings obtained in the present study support this. Based on the findings, one can conclude that keeping chemotherapy-related symptoms under control is extremely important to effectively coping with fatigue.

The findings of the current study show that patients had difficulty performing their daily activities because of fatigue. Similarly, Ream and Richardson (1997) found that fatigue limits the daily functioning of patients receiving chemotherapy. In the same study, they also determined that fatigue affected patients' exercise capacity, movement, and motivation. Rhodes, Watson, and Hanson (1988) determined that fatigue affects individuals' self-care activities. Meyerowitz et al. (1979) reported that fatigue in patients receiving chemotherapy for breast cancer significantly limited their ability to care for themselves, that patients had greater difficulty performing their daily activities (e.g., doing housework), and that patients were no longer able to enjoy their free time. In addition, fatigue has been found to be associated with less daytime activity (Berger & Farr, 1999). Determining patients' level of fatigue and then ensuring that particular activities are planned for patients are clearly important responsibilities for nurses.

Most patients with cancer tend to limit their activities during treatment. They may do so as a way to conserve their energy to cope with fatigue. In Turkish society, having a cancer diagnosis may be perceived as being dependent on others and may make individuals more passive. This sort of thinking also may cause patients to decrease their activities and increase their tendency to rest. Exercise, distraction, and pharmacologic and psychological treatments have been reported to be beneficial in helping patients cope with cancer-related fatigue (Nail, 2002; Ream & Richardson, 1999; Stone, 2002). In particular, increasing evidence exists suggesting that aerobic exercise programs are effective in decreasing fatigue in patients receiving chemotherapy (Adamsen et al., 2004; Mock et al., 2001; Stricker, Drake, Hoyer, & Mock, 2004). Ream et al. (2002) determined that education and support in managing fatigue enabled individuals to cope better with the symptoms and their illness. Godino, Jodar, Duran, and Martinez (2006) found that an individualized and structured nursing intervention with education decreased the level of fatigue in patients with colon or gastric cancer. In this study, health education, enhancement of problem-solving skills, stress management,

and psychological support were examined for their effect on decreasing fatigue. At the conclusion of the study, the patients experienced less fatigue six months after the intervention (Trask, Paterson, Esper, Pau, & Redman, 2004).

The majority of patients who used these measures in the present study stated that they were "partially effective" or "ineffective" in decreasing fatigue. Studies have reported that patients receiving chemotherapy organize their activities to prevent fatigue, to rest, and to try to cope psychologically (Dimeo, 2001; Ream & Richardson, 1997). In a series of studies by Dodd (1982, 1984, 1988), patients with cancer tried to cope with fatigue using several activities, which they found to be partially effective. Ream and Richardson (1997) reported that measures for coping with fatigue used by patients receiving chemotherapy were partially effective (54%) or not effective (9%). These results are similar to the data obtained in the present study. Clearly, most patients experience fatigue and need the help of healthcare professionals in coping effectively with its symptoms.

Conclusions and Recommendations

The fatigue experienced by the majority of patients in the study was at the moderate level and continued at the same level throughout the day. However, most of the measures used to cope with fatigue were not effective. In addition, the patients' daily activities were affected by fatigue. Based on these results, the authors of this study recommend that patients be supported in using strategies to help them cope with fatigue, that activities be planned together with patients to assist in coping, and that nurses be provided with procedures and information related to fatigue and its management and, if necessary, receive education on this topic.

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