

Original Article

The role of mental adjustment dimensions and disease stage in predicting cancer-related fatigue (CRF) in patients with cancer

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Abstract

Nowadays cancer is considered as a major public health problem, hence, it always remains as a part of research priorities. Physical and psychological distress in cancer creates a lot of stress. Fatigue is one of the symptoms experienced by patients with cancer. The purpose of this study is to investigate the role of mental adjustment dimensions and disease stage in predicting cancer related fatigue. The sample comprised of 120 patients hospitalized in Tajrish Shohada Hospital in Tehran in 2014 who were selected purposively. For collecting data, the questionnaires of Functional Assessment of Cancer Therapy- Fatigue (FACT-F), and the mini-Mental Adjustment to Cancer Scale (mini-MAC) were used. Multiple regression was also used to analyze the data. The overall regression model showed the significant role of variables such as disease stage and dimensions of mental adjustment in cancer related fatigue in such patients ($p < 0.01$). The R² value indicated that 17% of fatigue changes can be explained by the predictor variables. So besides providing physical care and nursing interventions, considering the presence of psychologists to pay attention to the psychological components of cancer patient's lives for increasing patient's mental adjustment and consequently reducing fatigue is important.

Keywords

Cancer
Fatigue
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Disease stage

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Introduction

Cancer is a disease characterized by uncontrolled cell growth, tissue invasion and systematic metastasis. Despite significant advances in medical sciences, cancer remains one of the most important diseases of the century and the second leading cause of death after cardiovascular diseases. Hearing the sentence "you have cancer" is devastating for everyone (Yang, 2011).

One of the most common symptoms experienced by cancer patients is cancer related fatigue. Fatigue is a symptom of persistent pain in patients with cancer which is produced by the disease itself and its therapeutic side effects. It is also a debilitating symptom which can persist for many years after diagnosis and treatment. Aranda, Milne and Osmond (2002) results showed that more than a quarter of the women had poor general health and the majority of patients reported fatigue. The prevalence of CRF in metastatic patients is more than 75% which has multiple clinical features such as generalized weakness, mood disorders, poor concentration, insomnia or hypersomnia, sleep disturbance, reduction of physical,

social and cognitive performance, lack of treatment and emotional distress (Balachandran et al., 2013).

CRF has harmful effects on many aspects of life quality, including aspects of physical, mental and social welfare of individuals. It can also limit person's ability to act, communicate and participate in activities which were delightful previously. CRF etiology is complex and multidimensional, and involves many potential elements including relevant factors to the tumor, comorbid mental/physical diseases and also side effects related to the treatment of cancer or other medications. Cancer-related fatigue is associated with impairment of the HPA, decreased physical activity, sleep disturbances, severity of inflammation and constant immune response (Ancoli et al., 2006; Campbell et al., 2005; Dimeo et al., 1998; Berger et al., 2007). However, the CRF is a complex and serious clinical problem, if it could be managed by structured and comprehensive work, it is capable to greatly improve the quality of life of patients (Koornstra et al., 2014). Cancer-related fatigue affects 30% of women with breast cancer and has significant effects on quality of life and mood in patients (Alexander et al.,

2009; Schwartz, 2000). In most patients with manifestations of pain and fatigue, the quality of life declines (Castori et al., 2012).

Considering distressing and painful symptoms of fatigue and its effect on the quality of life of patients with cancer, the current study was performed to study the role of mental adjustment dimensions and disease stage in predicting cancer-related fatigue in patients with cancer. Evidence shows that patients with cancer suffer from a range of psychological symptoms in the early months after the diagnosis and many of them have difficulty in coping with their illness (Chao et al., 2003). 47% of patients with cancer have been diagnosed for one of the psychological disorders of DSM-3 in which adjustment disorders like frustration, depression and anxiety are the most common (Minagawa et al., 1996). The term "adjustment" or "mental adjustment" which is often used in cancer, describes the absence of mental death in psychological context of general health (Johansson, 2010). Mental adjustment, which is widely associated with the theories of coping with stress, has derived from research in the field of stress (Watson et al., 1999). Dimeo et al. (1998) defined mental adjustment as the "cognitive and behavioral responses which patient creates against the diagnosis of cancer". Mental adjustment and coping have been recognized as important factors for Health-Related Quality of Life (HRQL) and psychological situation in patients with cancer. Adjustment responses such as fighting spirit which is known as "the very optimistic attitude" and has been reported along with a search for more information about cancer, would be beneficial while some responses like helplessness-hopelessness and the time that patient is disappointed and sees itself as severely sick, have been considered with negative effects on HRQL and mental health (Lampic et al., 1994). Adaptive coping strategies (e.g., fighting spirit, positive consideration and seeking support) are generally associated with optimal levels of adjustment, while maladaptive strategies (e.g., helplessness-hopelessness, anxious preoccupation) are associated with poor psychosocial consequences (Boyes et al., 2011; Dunkel et al., 1999). Adjustment process that is used by some cancer patients, enable them to concentrate on their different strengths and strategies to develop their own attitudes and skills which help them to live with cancer (Huang et al., 2014). The concept of coping and adjustment is important for clinicians and researchers to apply as a means to enhance the quality of life of cancer survivors (Stein et al., 2008).

Disease stage is a part of clinical characteristics associated with the disease process that is visible and can be determined. Doctors describe cancer in several stages; stage 0: cancer is just beginning and it is probable that some cancers wouldn't exceed anymore. Step 1: In this stage, cancer cells pass through the basement membrane and invade the surrounding tissue; this stage is called localized cancer. Step 2 and 3: In this stage, cancer cells enter into the lymph nodes and make tumors within them. Step 4: cancer cells are published form one lymph node to the other lymph nodes and will be released into the

blood stream. In step 4, cancer cells would release in every part of the body and form new colonies. Due to the fact that the higher the level of disease stage, the worse its impact on the individual is (Isikhan et al., 2001), and given that cancer stage affects the nature and incidence of mental disorders (Minagawa et al., 1996); the current study examines the role of diseases stage in predicting fatigue in patients with cancer.

Method

Participants

The method of the present study was descriptive and correlational. The sample comprised of 120 cancer patients hospitalized in Tajrish Shohada Hospital in 2014 in Tehran that were selected purposefully. Entry criteria included: the age range of 18 to 60 years, a diagnosis of cancer, not having any other chronic disease and the guidance school education as the minimum level of education.

Instrument

Functional Assessment of Cancer Therapy-Fatigue (FACT-F):

consists of 28 questions to assess the cancer-related quality of life and the other 13 questions for assessing fatigue. This questionnaire is easy to perform and is designed for patients who are under treatment. Subjects will be asked to answer the 13 questions related to her/his illness using a 5-point scale (0 = never to 4 = very much) with respect to the past 7 days. The range of possible scores in this scale is from 0 to 52. The internal consistency of the questionnaire has been reported 0/95, and Cronbach's alpha was from 0/93 to 0/95 for fatigue scale (Tennant, 2015).

The mini-Mental Adjustment to Cancer Scale (mini-MAC):

One of the most widely used tools to measure coping responses in patients with cancer. This questionnaire consists of 29 questions, and assesses 5 cognitive coping responses: helplessness-hopelessness, anxious preoccupation, cognitive avoidance, Fatalistic acceptance and fighting spirit. Psychometric properties of the mental adjustment scale have been approved in some studies, and for each 5 subscales a good reliability has been reported. Also it is suggested in some studies that some of these subscales can be combined to form a total subscale which expresses coping strategy, for instance it has been proposed to combine "Fatalistic acceptance" with "fighting spirit" to form the "positive attitude" subscale, and to combine "helplessness-hopelessness" with "anxious preoccupation" to achieve the "negative emotion" scale. Subjects are asked to answer all of 29 questions using a 4-point scale (1= definitely false about me, 4 = definitely true about me). High scores on the scale indicate the greater use of that

coping strategy. Cronbach's alpha coefficients for each subscale has been reported from 0.62 to 0.88 (Zucca et al., 2012).

Results

120 cancer patients, including 45 males and 75 females, participated in this study. 25 subjects were employed,

20 of them were retired, 23 were unemployed, and 52 were housewives. The subjects cancer included uterine (16%), rectum (16%), bladder (10%), breast (12%), prostate (8.5%), blood (6%) and other types of cancer (13%). In terms of disease stage, 8 patients (5.3%) were in the first stage, 20 patients (13.2%) were during the second stage, 75 patients (37.5%) were in the third stage and 35 patients (23%) were in the fourth stage.

Table 1. Standard deviation and mean of variables (n =120)

Variables	M	SD
Fatigue	24.77	5.75
Age	45.77	6.60
General Mental Adjustment	70.81	16.52
Helplessness-Hopelessness	22.28	2.44
Anxious preoccupation	19.67	3.59
Fighting Spirit	9.86	1.85
Fatalistic acceptance	12.68	2.05
Cognitive Avoidance	9.83	1.88

Table 1. results show that the mean (and standard deviation) scores were 77.45 (60/11) for the subjects' age, 81.70 (52.16) for general mental adjustment, 77.24 (75.5) for fatigue, 61.12 (05.2) for fatalistic acceptance, 86.9 (85.1) for fighting spirit, 67.19 (59.3) for anxious

preoccupation, 83.9 (88.1) for cognitive avoidance, and 28.22 (44.2) for helplessness-hopelessness.

In order to assess the relationship among studying variables, a correlation matrix was conducted that its results have been shown in Table 2.

Table 2. Correlation coefficients between fatigue with mental adjustment and its dimensions

Variables	Total mental adjustment	Fighting spirit	Anxious preoccupation	Helplessness-Hopelessness	Cognitive Avoidance	Fatalistic acceptance
Fatigue	0.37**	-0.13	0.30**	-0.38	0.06	0.08

**p<0.01

Table 2 results show that fatigue is significantly correlated with total mental adjustment and anxiety (p < 0.01). In addition to the correlation table (Table 2), the regression test was performed by Enter method in order

to assess the disease stage and mental adjustment dimensions as predictor variables in predicting fatigue as the criterion variable; results are show in the table below.

Table 3. Regression analysis results of fatigue based on disease stage and mental adjustment dimensions

Criterion variable	Predictor variables	R ²	F	Sig	B	SEB	β	t	Sig
		0.17	4.6	0.000					
Fatigue (CRF)	Disease stage				1.81	0.58	0.27	3.10	0.002
	Helplessness-hopelessness				-0.32	0.20	-0.13	1.5	0.12
	Cognitive avoidance				0.13	0.26	0.04	0.51	0.60
	Anxious preoccupation				0.44	0.14	0.28	3.20	0.002
	Fighting spirit				-0.42	0.26	-0.13	-1.6	0.11
	Fatalistic acceptance				0.42	0.23	0.11	1.38	0.17

The general model of regression analysis test shows that the role of mental adjustment dimensions and disease stage in predicting cancer-related fatigue is significant (P<0.01). R² value indicates that 17% of CRF changes can be predicted by variables of mental adjustment and disease stage. Beta coefficient was also considered for evaluating the role of components of mental adjustment and disease stage in predicting cancer-related fatigue, and it was determined that the role of anxious

preoccupation in predicting patients' fatigue was significant (P<0.01). According to the results, the role of disease stage was also significant in predicting fatigue in patients with cancer (P<0.01), and the Beta vale was 27% as well. MANOVA test was also performed to determine the difference between disease stages by considering fatigue. It was found that there is a significant difference between the first and fourth stages of the disease in terms of fatigue (P<0.05).

Table 4. Tukey test for the pairwise comparison of cancer stages in terms of fatigue

Dependent Variable	Disease stage (I)	Disease stage (J)	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
fatigue	first	second	-2.02	2.33	.822	-8.10	4.05
		third	-3.89	2.10	.256	-9.38	1.59
		fourth	-5.86*	2.18	.041	-11.56	-.16

second	first	2.02	2.33	.822	-4.05	8.10
	third	-1.87	1.45	.571	-5.65	1.90
	fourth	-3.84	1.56	.072	-7.91	.23
third	first	3.89	2.10	.256	-1.59	9.38
	second	1.87	1.45	.571	-1.90	5.65
	fourth	-1.97	1.19	.358	-5.09	1.15
fourth	first	5.86*	2.18	.041	.16	11.56
	second	3.84	1.56	.072	-.23	7.91
	third	1.97	1.19	.358	-1.15	5.09

According to table 4, there is a significant difference between the first and fourth stages in terms of fatigue ($p < 0.05$).

Discussion

Causes of fatigue in patients with cancer include anemia, hypothyroidism, depression and sleep disturbances which severely affect patients' quality of life. In such distressing condition, these patients would suffer from stress and anxiety because of their poor communication which undermines their compatibility and intensifies fatigue consequently (Xu et al., 2015). According to these findings, fatigue and mental adjustment are positively and significantly correlated. Since cancer patients are more likely to experience significant mental adjustment problems (Eiser et al., 2000; Zebrack et al., 2004); depending on coping skills and psychosocial support, mental adjustment of patients toward the diagnosis and treatment of cancer may be less or more.

Depression and anxiety in patients with cancer severely reduce mental adjustment of such patients (Gotheridge & Dresner, 2002). Skin (1994) showed that about 30% of patients with cancer suffer from mental health problems because of the incompatibility with their disease and feel disorganized in their family life (Zucca et al., 2012). Cancer-related fatigue is accompanied by psychological distress, and Linda et al., (Brown & Kroenke, 2009) in their study confirmed the relationship between cancer-related fatigue with depression and anxiety. According to the results, anxiety (a component of mental adjustment) is positively correlated with fatigue; so it can be concluded that as the anxiety increases, cancer-related fatigue worsens. Also according to the regression test, anxiety can predict fatigue.

In explaining these findings, previous studies and theories can be used to explicate the role of anxiety in formation of fatigue. The most common model in this context is the theory of Selye (1987) named "General Adjustment Syndrome" (Yellen et al., 1997). According to this model, high level of anxiety leads to experience stress in individual, and the individual would suffer from fatigue and hopelessness when he/she is facing with stressful events. If to a cancer patient, the diagnosis of cancer would be a serious threat against his/her life, he/she will be extremely anxious; and anxiety would become a clinical problem gradually, since the meaning of events is an important factor in distressing individuals. The positive relationship between anxiety and fatigue has been shown in many studies (Huang et

al., 2014; Hill et al., 1990; Xu et al., 2015). Anxiety can increase the susceptibility to fatigue. Servaes et al., (Servaes et al., 2001) found that those who report a great fatigue through cancer disease, have a high anxiety score as well. In the fourth stage of cancer, fatigue is much severe than other stages; and according to the results of regression test, the disease stage can predict fatigue. This finding is consistent with the results of Huang et al., (Huang et al., 2014) which explain that the prevalence of fatigue increases with the frequency of radiation therapy, and consequently patients in upper stages of cancer would suffer from higher levels of fatigue because of the numerous and long-term treatments. This finding is also consistent with the result of Minagawa et al., (Minagawa et al., 1996) based on the fact that cancer stage influences the nature and incidence of mental disorders and worsens fatigue and physical problems.

Conclusion

According to the findings of the current study, disease stage can predict cancer-related fatigue, and fatigue in the fourth stage is much severe than other stages of cancer. Hence, it is suggested that authorities of primary care, nurses and psychologists pay especial attention to the cancer-related fatigue and try to relieve fatigue and improve health-related quality of life in patients with cancer. As described above, mental adjustment dimensions such as anxious preoccupation is positively correlated with fatigue; and by worsening anxious preoccupation, fatigue increases as well. So it is recommended that nurses and psychologists consider the contributing psychological factors like mental adjustment in the process of recovery in patients with cancer and try to improve the level of mental health in such patients.

The lack of control of some variables like perceived social support and related familial factors were the limitations of the current study. So studying on larger samples and considering affective social and familial factors associated with cancer in future researches, can increase the generalizability of the results.

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Conflict of interest

No potential conflict of interest was reported by the authors.

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