



## The role of affective temperament and emotional expression in predicting chronic fatigue in patients with cancer hospitalized in Ardabil City, Iran, during the autumn of 2016

Sajjad Basharpour<sup>1</sup> , Fazeleh Heidari<sup>1</sup>, Behnam Nasri-Nasrabadi<sup>1</sup>

<sup>1</sup> Department of Psychology, School of Educational Sciences and Psychology, University of Mohaghegh Ardabili, Ardabil, Iran

### Original Article

#### Abstract

**BACKGROUND:** Affective temperament and emotional expression can be important in the mental and physical consequences of patients with cancer. This study aimed to determine the role of affective temperament and emotional expression in predicting chronic fatigue in patients with cancer.

**METHODS:** 110 patients with cancer, hospitalized in the surgery and hematology wards of Fatemi and Imam Khomeini Hospitals in Ardabil City, Iran, in autumn of 2016, were selected by purposive sampling and participated in this cross-sectional study. The Affective and Emotional Composite Temperament Scale (AFECTS), Berkeley Expressivity Questionnaire (BEQ), and Chalder Fatigue Scale (CFQ) were used to collect data. The collected data were analyzed by correlation coefficient and multiple regression analysis using SPSS software.

**RESULTS:** Chronic fatigue positively correlated with depressive ( $r = 0.69, P < 0.01$ ), anxious ( $r = 0.59, P < 0.01$ ), apathetic ( $r = 0.64, P < 0.01$ ), dysphoric ( $r = 0.37, P < 0.01$ ), volatile ( $r = 0.61, P < 0.01$ ), irritable ( $r = 0.36, P < 0.01$ ), disinhibited ( $r = 0.33, P < 0.01$ ), and obsessive ( $r = 0.52, P < 0.01$ ) affective temperaments, but it negatively correlated with cyclothymic ( $r = -0.35, P < 0.01$ ), hyperthymic ( $r = -0.62, P < 0.01$ ), euphoric ( $r = -0.69, P < 0.01$ ), and euthymic ( $r = -0.21, P < 0.01$ ) affective temperaments. Also, it was found that there was a negative relationship between chronic fatigue and emotional expression ( $r = -0.27, P < 0.01$ ). Results of regression analysis showed that 79% of the total variance of chronic fatigue was explained by affective temperaments. In addition, 27% of the total variance of the chronic fatigue was explained by emotional expressiveness.

**CONCLUSION:** These findings suggest that we can consider the affective temperament and emotional expression as psychological factors underlying the chronic fatigue in patients with cancer.

**KEYWORDS:** Cancer; Affective Temperament; Expressed Emotion; Fatigue Syndrome Chronic

**Date of submission:** 02 July 2019, **Date of acceptance:** 10 Sep. 2019

**Citation:** Basharpour S, Heidari F, Nasri-Nasrabadi B. The role of affective temperament and emotional expression in predicting chronic fatigue in patients with cancer hospitalized in Ardabil City, Iran, during the autumn of 2016. *Chron Dis J* 2020; 8(4): 168-75.

#### Introduction

Despite remarkable advances in medical sciences, cancer continues to be one of the most important diseases in Iran and it is the second leading cause of death after cardiovascular

diseases.<sup>1</sup> This disease is characterized by an abnormal change in cells and a loss of cell differentiation. Currently, more than 7 million people in the world die because of cancer and it is predicted that the number of new infections will reach 15 million annually until 2020.<sup>2</sup> One of the most comprehensive and suffering problems in patients with cancer is chronic fatigue syndrome (CFS). CFS significantly adds to the cancer symptoms and it is observed in all types and stages of the

#### Corresponding Author:

Sajjad Basharpour; Department of Psychology, School of Educational Sciences and Psychology, University of Mohaghegh Ardabili, Ardabil, Iran  
Email: basharpour\_sajjad@uma.ac.ir

disease.<sup>3</sup> According to the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5), this syndrome refers to the general fatigue of the body that continues a long time. This fatigue spreads throughout the body and reduces physical activity and individual power. Muscle pain and constant fatigue, memory deficits, severe headaches, tender lymph nodes in the neck and armpits, and cough are some common symptoms of this disorder.<sup>4</sup> In fact, 61% to 99% of patients who receive treatment for cancer experience prolonged fatigue. This problem can disrupt the patient's daily functioning and lead to a negative impact on the quality of life (QOL), self-care ability, and willingness to continue the healing process.<sup>5</sup>

Research has shown that the prevalence and severity of cancer-related fatigue are associated with personality and psychological factors in these patients. For example, the relationship between an anxious and depressed character with this syndrome has been shown in the literature.<sup>6</sup> On the other hand, experiences of fear, anger, guilt, and lack of response to positive emotions are a common phenomenon in patients with cancer.<sup>7</sup> One of the most important basic personality characteristics, underlying our emotions and affects, is affective temperament. Temperament is represented by a series of signs and features usually manifested via certain stability of mood, attitudes to the environment, sensitivity to external stimuli, and characteristic modes of reaction.<sup>8</sup> Lara *et al.* have proposed a model in which the affective temperament is categorized into twelve features: a) depressive, b) anxious, c) apathetic, d) cyclothymic, e) dysphoric, f) volatile, g) obsessive, h) euthymic, i) hyperthymic, j) irritable, k) disinhibited, and l) euphoric.<sup>9</sup> One of the features of this model is that it provides a more general approach toward suggestibility to physical and mental disorders. For example, depressive temperament has high comorbidity with

trauma developed by the diagnosis of human immunodeficiency virus (HIV) disease and it predicts lower QOL in patients with acquired immunodeficiency syndrome (AIDS) and also, cyclothymic and irritable temperaments are significantly higher in substance-dependent individuals.<sup>10</sup> Individual's temperamental features are one of the most important factors in predicting the risk of cancer and treatment progress.<sup>11</sup> Awada *et al.* showed that affective temperament was one of the factors of mental functions for depression in patients with cancer.<sup>12</sup>

On the other hand, the emotional expression that is the opposite of emotional inhibition has been studied as one of the other dimensions of emotion regulation concerning chronic diseases. Individuals with a higher level of emotional expression show more emotional responses (e.g., sadness by crying) and have more inner desire to participate in emotional interactions.<sup>13</sup> Emotional expression is one of the important factors in patients with cancer prone to treatment-related fatigue. For example, a low level of emotional expressiveness increases the risk of early death due to cancer.<sup>14</sup> Porter *et al.* evaluated emotional expressiveness about the amount of pain and life quality among patients with gastric cancer; they found that patients with low emotional expressiveness reported higher levels of chronic pain and showed a poorer QOL.<sup>15</sup> Also, emotional expressiveness has been emphasized as a catalyst for better compatibility<sup>16</sup> and higher healthy behaviors in patients with cancer.<sup>17</sup>

Based on this evidence, it can be assumed that affective temperament can be regarded as one of the important factors related to cancer. Research shows that individual differences in affective temperament of patients with cancer can predict the consequences of their health and QOL. On the other hand, the emotional expression can be an important factor in psychological outcomes of cancer such as chronic fatigue. Given that the previous studies

have focused on the role of these variables in depression and anxiety in patients with cancer and the other outcomes such as chronic fatigue have not been studied, the present study aimed to determine the role of affective temperament and emotional expression in predicting chronic fatigue in patients with cancer.

## Materials and Methods

The method of this cross-sectional study was correlational. All patients with cancer, hospitalized in the surgery and hematology wards of Fatemi and Imam Khomeini Hospitals in Ardabil City, Iran, in autumn of 2016, comprised the statistical population of this study ( $n = 134$ ). 110 patients were selected by purposive sampling method from this population and participated in this study. All patients who had inclusion criteria (110 patients) were selected to participate in this study due to a low population size. The following tools were used to collect data:

**Affective and Emotional Composite Temperament Scale (AFFECTS):** This scale was developed by Lara *et al.* in 2012 aiming to integrate affective and emotional temperament in the form of one comprehensive model. 52 items of these scale measure six emotional temperaments including volition, anger, inhibition, sensitivity, coping, and control in a 7-point Likert scale and 12 questions of this scale measure 12 affective temperaments including depressive, anxious, apathetic, cyclothymic, dysphoric, volatile, obsessive, euthymic, hyperthymic, irritable, disinhibited, and euphoric in a 5-point Likert scale. Cronbach's alpha coefficient range has been reported for this scale to be 0.86 (total) and for subscales between 0.75 to 0.91.<sup>9</sup> Cronbach's alpha coefficients for this scale in Iranian university students were reported totally 0.82 and for its subscales between 0.49 to 0.89.<sup>18</sup>

**Berkeley Expressivity Questionnaire (BEQ):** This questionnaire was developed by Gross and John and consists of 16 items that measure

emotional expressiveness in a 7-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). This questionnaire has been composed of 3 subscales including impulse severity, negative expression, and positive expression. The impulse severity subscale evaluates the severity of emotional expressiveness; the negative expression subscale consists of 6 items and positive expression contains 4 items. The internal consistency and test-retest reliability of this questionnaire have been reported well. Convergent and divergent validity of each of the subscales of this questionnaire was evaluated as good.<sup>19</sup> The Cronbach's alpha coefficients for impulse control, negative expressivity, positive expressivity, and the total score have been reported 0.76, 0.68, 0.74, and 0.75, respectively, in an Iranian sample.<sup>20</sup>

**The Chalder Fatigue Scale (CFQ):** This scale has been developed by Chalder *et al.*<sup>21</sup> and includes 14 questions that measure mental and physical signs of fatigue that are related to characteristic symptoms of chronic fatigue. This scale has four components: cognitive problems, drowsiness, resistance and power, and lack of motivation and interest. Chalder *et al.*<sup>21</sup> reported that the internal consistency coefficient of this scale was 0.89. The test-retest reliability coefficient for the whole scale, physical fatigue, and mental fatigue subscales was obtained, respectively, 0.85, 0.81, and 0.74.<sup>21</sup> The Cronbach's alpha coefficients for physical fatigue, mental fatigue, and the total score have been reported 0.71, 0.88, and 0.79, respectively, in the samples of this study.

To collect data, after obtaining the necessary permits, we referred to the surgery and hematology wards of Fatemi and Imam Khomeini Hospitals in Ardabil, and the list of all patients hospitalized in these wards was provided. Then, from the list of these patients, 110 people were selected according to inclusion criteria. Participants provided informed consent before participation; then, they were asked to

answer AFECTS, BEQ, and CFQ, respectively, in the ward and individually. Diagnosing cancer, having a reading and writing ability, and the willingness to participate in the study were the inclusion criteria and the high severity of disease was the exclusion criterion. This study was approved by the research and technology committee of the University of Mohaghegh Ardabili, Ardabil (contact number, 1015; 96.05.21).

The gathered data were analyzed using descriptive tools of mean and standard deviation (SD), Pearson correlation, and multiple regression analysis.

## Results

110 patients with the mean age of  $48.41 \pm 7.65$  years participated in this study. The demographic characteristics of the subjects are shown in table 1.

**Table 1. Descriptive characteristics of participants**

Variables	Category	n (%)
Gender	Male	64 (58.2)
	Female	46 (41.8)
Marriage status	Single	15 (13.6)
	Married	95 (86.4)
Educational status	Primary school	67 (60.9)
	Middle school	28 (25.5)
	High school	9 (8.2)
Employment status	Undergraduate	6 (5.5)
	Government employee	8 (7.3)
	Self-employed	48 (43.6)
	Unemployed	52 (47.3)
Cancer type	Other (retired)	2 (1.8)
	Colon	19 (17.3)
	Rectal	8 (7.3)
	Laryngeal	5 (4.5)
	Pancreatic	2 (1.8)
	Prostate	2 (1.8)
	Ovarian	4 (3.6)
	Anal	6 (6.4)
	Blood	19 (17.3)
	Breast	7 (6.4)
	Esophageal	7 (6.4)
Cardia	19 (17.3)	
Gastric	12 (10.9)	

Table 1 shows the frequency and percentage of subjects participating in this research in

terms of gender, marriage, education, employment, and type of cancer.

The results of table 2 showed that chronic fatigue of patients with cancer positively correlated with depressive ( $r = 0.69$ ,  $P < 0.01$ ), anxious ( $r = 0.59$ ,  $P < 0.01$ ), apathetic ( $r = 0.64$ ,  $P < 0.01$ ), dysphoric ( $r = 0.37$ ,  $P < 0.01$ ), volatile ( $r = 0.61$ ,  $P < 0.01$ ), irritable ( $r = 0.36$ ,  $P < 0.01$ ), disinhibited ( $r = 0.33$ ,  $P < 0.01$ ), and obsessive ( $r = 0.52$ ,  $P < 0.01$ ) affective temperaments, but it negatively correlated with cyclothymic ( $r = -0.35$ ,  $P < 0.01$ ), hyperthymic ( $r = -0.62$ ,  $P < 0.01$ ), euphoric ( $r = -0.69$ ,  $P < 0.01$ ), and euthymic ( $r = -0.21$ ,  $P < 0.01$ ) affective temperaments.

The results of table 3 showed that chronic fatigue had a significant positive relationship with positive expression ( $r = 0.46$ ,  $P < 0.01$ ), impulse severity ( $r = 0.18$ ,  $P < 0.01$ ), and emotional expressiveness ( $r = 0.27$ ,  $P < 0.01$ ), but it had a significant negative relationship with component of negative expressiveness ( $r = -0.27$ ,  $P < 0.01$ ).

The results of table 4 showed that 79% of the total variance of chronic fatigue was explained by affective temperaments. Analysis of variance (ANOVA) test results showed that the regression model was significant ( $F = 31.15$ ,  $P < 0.01$ ). The results of the regression coefficients indicated that among predictive variables, depressive ( $t = 2.79$ ), cyclothymic ( $t = -2.42$ ), volatile ( $t = 4.12$ ), obsessive ( $t = 3.45$ ), and hyperthymic ( $t = 2.61$ ) temperaments could predict the chronic fatigue in patients with cancer.

The results of table 5 showed that 27% of the total variance of chronic fatigue was explained by emotional expression. ANOVA test results showed that the regression model was significant ( $F = 13.12$ ,  $P < 0.01$ ). The results of the regression coefficients indicated that among predictive variables, t-values of positive expression ( $t = 4.36$ ) and negative expression ( $t = -2.86$ ) in the level of  $P < 0.01$  were significant. In the other words, these variables could significantly predict chronic fatigue in patients with cancer.

**Table 2. Mean, standard deviation (SD), and correlation coefficients between chronic fatigue and affective temperaments**

Variables	Mean ± SD	Depressive	Anxious	Apathetic	Cyclothymic	Dysphoric	Volatile	Obsessive	Euphoric	Hyperthymic	Irritable	Disinhibited	Euthymic	Physical fatigue	Mental fatigue
Depressive	3.44 ± 1.23	1													
Anxious	3.07 ± 1.09	0.59*													
Apathetic	2.51 ± 1.12	0.54*	0.58*												
Cyclothymic	2.73 ± 0.73	0.33*	-0.18	-0.13											
Dysphoric	2.16 ± 0.82	0.26*	0.39*	0.52*	-0.04										
Volatile	2.40 ± 0.97	0.37*	0.56*	0.40*	-0.20*	0.39*									
Obsessive	2.60 ± 0.96	0.45*	0.34*	0.42*	-0.12	0.15	0.22								
Euphoric	2.97 ± 1.12	-0.52*	-0.45*	-0.68*	0.11	-0.32*	-0.39	-0.32							
Hyperthymic	2.17 ± 0.90	-0.53*	-0.39*	-0.60*	0.14	-0.41*	-0.27	-0.30*	0.77*						
Irritable	2.04 ± 0.97	0.18*	0.43*	0.29*	-0.15	0.29*	0.54	0.22*	-0.04	0.11					
Disinhibited	2.56 ± 0.84	0.29*	0.41*	0.28*	-0.05	0.22*	0.57	0.21*	-0.18	-0.01	0.65*				
Euthymic	2.97 ± 1.13	-0.02	-0.17	-0.01	0.16	0.02	-0.53	-0.39*	0.01	-0.19*	-0.42*	-0.51*			
Physical fatigue	20.96 ± 5.37	0.71*	0.64*	0.67*	-0.37*	0.40*	0.62	0.42*	-0.66*	0.62*	0.40*	0.35*	-0.14		
Mental fatigue	12.25 ± 2.61	0.40*	0.30*	0.38*	-0.17	0.19*	0.39	0.55*	-0.51*	-0.42*	0.15	0.17	-0.28*	0.53*	
Chalder's fatigue	31.21 ± 7.12	0.69*	0.59*	0.64*	-0.35*	0.37*	0.61	0.52*	-0.69*	-0.62*	0.36*	0.33*	-0.21*	0.95*	0.76*

SD: Standard deviation

\* P &lt; 0.05



**Table 3. Mean, standard deviation (SD), and correlation coefficients scores in subjects with chronic fatigue and emotional expressiveness**

Variables	Mean ± SD	Positive expression	Impulse severity	Negative expression	Emotional expressiveness	Physical fatigue	Mental fatigue
Positive expression	13.10 ± 3.62	1					
Impulse severity	23.70 ± 3.97	0.30*					
Negative expression	16.24 ± 2.54	-0.13	0.23*				
Emotional expressiveness	56.07 ± 7.47	0.69*	0.81*	0.32*			
Emotional expressiveness	20.96 ± 5.37	0.49*	0.15	-0.28*	0.27*		
Physical fatigue	12.25 ± 2.61	0.23*	0.19*	-0.16	0.18	0.53*	
Mental fatigue	33.21 ± 7.12	0.46*	0.18	-0.27*	0.27*	0.95*	0.76*

SD: Standard deviation

\* P &lt; 0.05

### Discussion

This study was conducted to determine the role of affective temperament and emotional expression in predicting chronic fatigue in patients with cancer disease. Correlation results showed that chronic fatigue of patients with cancer positively correlated with depressive, anxious, apathetic, dysphoric, volatile, irritable, disinhibited, and obsessive affective temperaments, but it negatively correlated with cyclothymic, hyperthymic, euphoric, and euthymic affective temperaments. Also, the results of regression analysis showed that the depressive, cyclothymic, volatile, obsessive, and hyperthymic temperaments could predict chronic fatigue in patients with cancer. These results are consistent with the results of Awada et al.<sup>12</sup> and Kukulj et al.<sup>22</sup> about the association

between negative affective temperaments such as depressive and anxious temperaments and cancer and mental health problems related to this disease. In terms of the positive relationship between depressive, anxious, apathetic, dysphoric, volatile, irritable, disinhibited, and obsessive temperaments and chronic fatigue, according to Lara et al.,<sup>9</sup> it can be said that the negative emotions, as a common feature of these temperaments, can mediate the relations between these variables. On the other hand, the negative correlation between cyclothymic, hyperthymic, euphoric, and euthymic affective temperaments, characterized by positive emotions, with chronic fatigue reveals that experiencing positive emotions can operate as a protective factor against chronic fatigue in patients with cancer.

**Table 4. Linear regression model for chronic fatigue based on affective temperaments**

The criterion variable	Predictor variables	B	Standard error of $\beta$ (SEB)	$\beta$	t	P
Chronic fatigue	Constant	28.88	3.15	-	9.17	0.01
	Depressive	1.18	0.42	0.20	2.79	0.01
	Anxious	-0.19	-0.02	-0.02	-0.42	0.67
	Apathetic	0.17	0.50	0.02	0.34	0.72
	Cyclothymic	0.50	-1.22	-0.12	-2.42	0.01
	Dysphoric	-0.22	0.44	-0.03	-0.64	0.52
	Volatile	2.46	0.59	0.33	4.12	0.01
	Obsessive	2.00	0.57	0.23	3.45	0.01
	Euthymic	-1.07	0.66	-0.14	-1.60	0.11
	Hyperthymic	1.61	0.62	0.19	2.61	0.01
	Irritable	-0.68	0.63	-0.08	-1.08	0.28
	Disinhibited	-0.76	-0.56	-0.09	-1.35	0.17
	Euphoric	-0.68	0.63	-0.08	-1.08	0.28
R <sup>2</sup>	0.79					
F (P)	31.15					0.01

**Table 5. Linear regression model for chronic fatigue based on emotional expressiveness variable**

The criterion variable	Predictor variables	B	Standard error of $\beta$ (SEB)	$\beta$	t	P
Chronic fatigue	Constant	29.16	5.03		5.79	0.01
	Positive expression	0.76	0.17	0.38	4.36	0.01
	Impulse severity	0.22	0.16	0.12	1.40	0.16
	Negative expression	-0.70	0.24	-0.25	-2.86	0.01
R <sup>2</sup>	0.27					
F (P)	13.12					0.01

Reversely, experiencing negative emotions can be considered as a risk factor for chronic fatigue. It seems that people who receive the diagnosis of cancer encounter suddenly with the end of their lives and this issue increases negative emotions and puts them in the downward trend of stress and fatigue.

The results of this study showed that chronic fatigue had a negative relationship with emotional expressiveness. Furthermore, the regression analysis showed that positive and negative expressiveness could significantly predict chronic fatigue. These results are consistent with the results of Chapman *et al.*,<sup>14</sup> Porter *et al.*,<sup>15</sup> Brandao *et al.*,<sup>16</sup> and Lepore *et al.*<sup>17</sup> These results reveal that patients with cancer who express emotions have better mental health and have low suggestibility to chronic fatigue and other psychological consequences of diagnosing cancer disease. Emotional expression plays an important role in adaptive human functioning and it has been shown to benefit physical and mental health in the general population as well as specific populations, such as women diagnosed with breast cancer.<sup>23</sup> Emotional expressivity is an important strategy to regulate emotion. According to the literature, the greater habitual use of suppression results in higher negative emotions for people, and negative emotions lead to high chronic fatigue. More specifically, Gross and John<sup>19</sup> articulated that emotional expressivity could lead to reducing negative emotions, but emotion suppression resulted in increasing negative emotions such as fatigue. Because diagnosing the cancer increases the negative emotions such as sadness, fear, and anger, using the

expressivity strategy may be a way to externalize these negative emotions.

This study had some limitations. Firstly, the sample size was small. Secondly, the study data were collected using self-report questionnaires. Thirdly, the inability to control some confounding variables, especially the severity of disease and presence of the underlying disease, can limit the results. Lastly, correlational research design, in which the ability to casual evaluation is not referred, was another limitation of this study. Therefore, it is recommended that instruments such as structured clinical interview and observation methods be used to collect data along with self-report questionnaires. Furthermore, future research should be done with larger sample sizes to increase generalization of results. Also, similar studies can take control of different variables and psychological intervention of patients with cancer. The results of this study suggest the use of emotion regulation and emotional expressiveness skills in designing psychological interventions in patients with cancer.

### Conclusion

The results of this study indicate that affective temperament and emotional expression have an important role in predicting chronic fatigue in patients with cancer. These findings support the assumption that we can consider the affective temperament and emotional expression as psychological factors underlying chronic fatigue.

### Conflict of Interests

Authors have no conflict of interests.

### Acknowledgments

The authors of this article would like to thank all participants and the staff and management of Fatemi and Emam Khomeini Hospitals located in Ardabil City for generous cooperation during the administration of this study. This study was provided by the research and technology committee of University of Mohaghegh Ardabili (contact number, 1015; 96.05.21).

### References

1. Russo MM, Sundaramurthi T. An overview of cancer pain: Epidemiology and pathophysiology. *Semin Oncol Nurs* 2019; 35(3): 223-8.
2. Hassanpour A, Azari E. Quality of life and related factors in cancer patients. *Proceedings of the National Congress of Care in Special Diseases*; 2006 Nov. 9; Ahvaz, Iran. 2006. p. 42. [In Persian].
3. Ma Y, He B, Jiang M, Yang Y, Wang C, Huang C, et al. Prevalence and risk factors of cancer-related fatigue: A systematic review and meta-analysis. *Int J Nurs Stud* 2020; 111: 103707.
4. American Psychiatric Association. *Diagnostic and statistical manual of mental disorders (DSM-5®)*. Washington, DC: American Psychiatric Pub; 2013.
5. Winningham ML, Nail LM, Burke MB, Brophy L, Cimprich B, Jones LS, et al. Fatigue and the cancer experience: The state of the knowledge. *Oncol Nurs Forum* 1994; 21(1): 23-36.
6. So WK, Marsh G, Ling WM, Leung FY, Lo JC, Yeung M, et al. The symptom cluster of fatigue, pain, anxiety, and depression and the effect on the quality of life of women receiving treatment for breast cancer: A multicenter study. *Oncol Nurs Forum* 2009; 36(4): E205-E214.
7. Asvadi Kermani I, Ashraphian P, Zeinali S, Imani M, Shabanloei R. A study of cancer patients' personality profile and its comparison with that of normal persons. *Avicenna J Clin Med* 2010; 16(4): 26-30. [In Persian].
8. Fuscaldo LV, Bisol LW, Lara DR. How emotional traits and affective temperaments relate to cocaine experimentation, abuse and dependence in a large sample. *Addict Behav* 2013; 38(3): 1859-64.
9. Lara DR, Bisol LW, Brunstein MG, Reppold CT, de Carvalho HW, Ottoni GL. The Affective and Emotional Composite Temperament (AFECT) model and scale: A system-based integrative approach. *J Affect Disord* 2012; 140(1): 14-37.
10. Ozturk FO, Ekinici M, Ozturk O, Canan F. The relationship of affective temperament and emotional-behavioral difficulties to internet addiction in Turkish teenagers. *ISRN Psychiatry* 2013; 2013: 961734.
11. Oniszczenko W, Laskowska A. Emotional reactivity, coping style and cancer trauma symptoms. *Arch Med Sci* 2014; 10(1): 110-6.
12. Awada N, Bergeron S, Steben M, Hainault VA, McDuff P. To say or not to say: Dyadic ambivalence over emotional expression and its associations with pain, sexuality, and distress in couples coping with provoked vestibulodynia. *J Sex Med* 2014; 11(5): 1271-82.
13. Kring AM, Smith DA, Neale JM. Individual differences in dispositional expressiveness: development and validation of the Emotional Expressivity Scale. *J Pers Soc Psychol* 1994; 66(5): 934-49.
14. Chapman BP, Fiscella K, Kawachi I, Duberstein P, Muennig P. Emotion suppression and mortality risk over a 12-year follow-up. *J Psychosom Res* 2013; 75(4): 381-5.
15. Porter LS, Keefe FJ, Lipkus I, Hurwitz H. Ambivalence over emotional expression in patients with gastrointestinal cancer and their caregivers: associations with patient pain and quality of life. *Pain* 2005; 117(3): 340-8.
16. Brandao T, Tavares R, Schulz MS, Matos PM. Measuring emotion regulation and emotional expression in breast cancer patients: A systematic review. *Clin Psychol Rev* 2016; 43: 114-27.
17. Lepore SJ, Revenson TA, Roberts KJ, Pranikoff JR, Davey A. Randomised controlled trial of expressive writing and quality of life in men and women treated for colon or rectal cancer. *Psychol Health* 2015; 30(3): 284-300.
18. Chalabianloo GH, Abdi R, Rasoulzadeh M, Sheikh S. Psychometric properties of affective & emotional composite temperament scale (AFECT) in students. *Journal of Psychology* 2016; 11(42): 51-71. [In Persian].
19. Gross JJ, John OP. Facets of emotional Expressivity: Three self-report factors and their correlates. *Pers Individ Dif* 1995; 19(4): 555-68.
20. Basharpoor S, Molavi P, Sheykhi S, Khanjani S, Rajabi M, Mosavi SA. The relationship between emotion regulation and emotion expression styles with bullying behaviors in adolescent students. *J Ardabil Univ Med Sci* 2013; 13(3): 264-75. [In Persian].
21. Chalder T, Berelowitz G, Pawlikowska T, Watts L, Wessely S, Wright D, et al. Development of a fatigue scale. *J Psychosom Res* 1993; 37(2): 147-53.
22. Kukulj S, Aukst MB, Jakovljevic M, Samarzija M. Temperament and character and quality of life in lung cancer patients. *Tumori* 2013; 99(6): 708-14.
23. Del Piccolo L, Mazzi MA, Mascanzoni A, Lonardi M, De Felice M., Danzi OP, et al. Factors related to the expression of emotions by early-stage breast cancer patients. *Patient Educ Couns* 2019; 102(10): 1767-73.