

Relationship of Ambivalence Over Emotional Expression and Cancer-Related Fatigue with Adherence to Treatment in Cancer Patients

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Quantitative Study

Abstract

Background: In addition to the body, cancer affects the mental health of patients and can be associated with significant cognitive-emotional and behavioral effects. Among the vital behavioral factors in cancer patients is adherence to treatment, which is essential due to the length of the treatment process. On the other hand, different styles of expressing emotions and fatigue related to this disease can impact adherence to treatment orders in patients. Therefore, the present research investigates the relationship of ambivalence over emotional expression (AEE) and cancer-related fatigue (CRF) with adherence to treatment in cancer patients.

Methods: The present study was a correlational research. The statistical population included all cancer patients with files in the Iranian Cancer Control Center (MACSA), Isfahan branch. From among them, 206 people (men and women) were selected through convenience sampling. The data collection tools used included the Ambivalence over the Expression of Emotion Questionnaire (AEQ; King and Emmons, 1990), Cancer Fatigue Scale (CFS; Okuyama et al., 2000), and General Adherence Scale (GAS; Hays et al., 1994). The collected data were analyzed using Pearson's correlation and stepwise regression statistical methods in SPSS software.

Results: As the results showed, there was a significant negative relationship between the variable of AEE and treatment adherence ($r = -0.184$; $P < 0.01$) and between the variable of CRF and treatment compliance ($r = -0.173$; $P < 0.05$). The variables of cancer fatigue and AEE predict a total of 4% of treatment adherence in cancer patients ($R^2 = 0.048$).

Discussion: The conflict in expressing or not expressing emotions the patients experience during the various stages of diagnosis and treatment, and the physical and psychological fatigue associated with the disease can significantly impact adherence to treatment in patients.

Keywords: Emotional; Fatigue; Treatment adherence

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Introduction

As reported by the World Health Organization (WHO; 2018), 18.1 million fresh cases of cancer were diagnosed in 2018, and 9.6 million people died because of cancer (Oh et al., 2020). In Iran, it has been predicted that the number of new cases of cancer in 2025 will reach over 130 thousand people, approximately a 35% increase in the current prevalence (Abachizadeh & Keramatinia, 2016). The diagnosis of this disease as a highly stressful event and its complex treatment process is associated with many psychological disturbances in the patient and his/her family members (Seyedtabaee, Rahmatinejad, Mohammadi, & Etemad, 2017). Cancer patients experience a range of negative moods, including tension, sadness, anger, fatigue, and confusion (Tabatabaieinejad, Golparvar, & Aghaei, 2019). These states affect patients psychologically and physically, and impact their behavioral direction. Following medication and treatment orders is a behavioral factor that is important because of the length of the disease treatment process in cancer patients. Adherence to treatment can be influenced by various factors, including the disease and treatment characteristics, the patient's characteristics, and those of the doctor and the health service system (Al Hamid, Ghaleb, Aljadhey, & Aslanpour, 2014).

Emotional and cognitive factors can also affect treatment adherence in patients. The two components of ambivalence over emotional expression (AEE) and disease fatigue are the most common factors that can lead to an increase in disease burden and affect treatment adherence. Emotional turmoil and lack of emotional regulation, followed by lack of expression or conflict in expressing emotions, can affect interpersonal relationships, health-oriented behaviors, doctor-patient-caregiver communication, and ultimately, efficacious treatment of patients. As the results of the research show, the experience of negative and disturbing emotions (Wandell, Ljunggren, Wahlstrom, & Carlsson, 2014) and AEE (Amiri, Ghasemi Gheshlagh, & Abbas Zadeh, 2018; Darandegan, 2015) is common in patients with chronic diseases and is associated with a decrease in acceptability, discontinuation of rehabilitation programs, non-adherence to risk-reducing healthy behaviors, and adherence to treatment (Kneeland, Dovidio, Joormann, & Clark, 2016).

Another variable that can be effective in the relationship between cancer-caused cognitive damage and the consequences of cancer, and can affect the adherence to treatment in these patients is cancer-related fatigue (CRF) (Jacobs et al., 2019). Fatigue, as researches show, has been a most annoying and lasting symptom in breast cancer survivors after treatment and is associated with non-observance of self-care behaviors, psychological distress, and non-compliance with therapeutic orders (Arch et al., 2021).

Vorobiof, Malki, Deutsch, and Bivasbenita (2018) showed in their study that severe fatigue, especially in patients with advanced breast cancer and lung cancer, significantly affected treatment adherence and led to poor adherence to treatment in patients.

Many researchers in Iran and the world have investigated the psychological factors that cancer patients struggle with. Examining the previous literature on patients with different cancers reveals that they have mainly paid attention to the expression or non-expression of emotions, and less conflict and AEE as essential psychological variables relevant to the various aspects of life and treatment of patients. The results in this field are contradictory. Researchers have discussed CRF as an influential component both in the expression of emotions and adherence to treatment in cancer patients. Conducting such research seems necessary because of

the **increase in the prevalence of this disease**, its long and complicated treatment process, and the lack of studies in this field. Therefore, the current research was conducted to determine whether AEE and CRF in cancer patients can affect treatment adherence in these patients.

Methods

Study Design and Participants

The present study was a correlational research. The statistical population of the current research comprised all cancer patients with files in the Iranian Cancer Control Center (MACSA), Isfahan branch. The present study sample included 206 people (men and women), with each type of cancer selected using a convenience sampling method. Due to the high prevalence and risk of Covid-19 disease, data were collected online. Accordingly, all patients who met the inclusion criteria were contacted, and the link to the research questionnaires was sent to patients after providing them with the necessary explanations, obtaining informed oral consent, and ensuring they are able to complete the questionnaire online. It should be noted that the questionnaires of the present study were completed individually, and in the case of any question or need for guidance in completing the questionnaires, the researcher answered them online.

Ethical considerations in the present study included obtaining oral consent for participation, all research patients having the freedom to withdraw from the study at any stage, and all their information being kept confidential. Patients were also ensured that not participating in the research or not continuing to cooperate would not affect the care provided to them and would not interfere with their treatment. Data entry and preparation of the final report, the information of subjects or their names were not disclosed in any of the data collection steps, and their data was not provided to any actual or legal person. Moreover, participation in the research did not impose any financial burden on the subjects.

The inclusion criteria were age range of 16-65 years, awareness of the disease by the patient, the passage of at least 1 year since the diagnosis of the disease, minimum literacy (ability to read and write), lack of any psychological treatment from the time of the onset of the disease until the time of the research, the absence of any other diseases, the absence of terminal conditions of the disease (End Stage), and the absence of major psychiatric disorders based on the DSM-V diagnostic criteria. The exclusion criteria were the subject's unwillingness to participate in the research and physical disability caused by the treatment.

Sample Size

In the current research, considering the error level of $\alpha = 0.05$ and the statistical power of 80% (Warwick & Lininger, 1975; Bashiri Nejadian, Bayazi, Joharifard, & Rajaei, 2021), the sample size of 200 people was calculated, and considering the possibility of loss of samples, the final sample size was considered to be 250 people. Finally, after removing the distorted questionnaires, the data of 206 people were included in the research.

Instruments and variable

Ambivalence over the Expression of Emotion Questionnaire: The original version of the Ambivalence over the Expression of Emotion Questionnaire (AEQ) includes 28 questions, and the number of questions in its Iranian version has been reduced to 23.

This questionnaire was developed by King and Emmons in 1990 and has two factors: ambivalence in expressing positive emotions and ambivalence in expressing negative emotions. This questionnaire is scored on a 5-point Likert scale ranging from

1 (never) to 5 (always) [5]. King and Emmons (1990) reported a Cronbach's alpha of 0.89 for the whole questionnaire, 0.87 for expressing positive emotions, and 0.77 for expressing negative emotions (King & Emmons, 1990). Alavi, Asgharimoghadam, Rahiminezhad, and Farahani (2017) examined the validity and reliability of this questionnaire in Iran. Their research confirmed this tool's validity, and the results showed that its reliability was between 0.77 and 0.86 by Cronbach's alpha method. In the present study, the reliability of this questionnaire was calculated to be 0.88 by Cronbach's alpha method.

General Adherence Scale: Hays et al. designed the General Adherence Scale (GAS) in 1994. The available adherence scale measures the patient's willingness to follow the physician's recommendations in general. It includes 5 items scored on a 6-point Likert scale. The scores of 2 items of the test (questions 1 and 5) are achieved reversely. In the study conducted by Hays et al. (1994), the validity of the test was determined through construct validity using internal consistency method ($R = 0.81$) and was reported at an acceptable level, and the reliability of this scale based on the test-retest method with a two-year interval was reported at 0.60. In Iran, Zarani, Zamani, Besharat, Ehsan, Rahiminejad, and Sadeghian (2010) obtained the reliability of this scale at 0.47 using Cronbach's alpha coefficient. In the present study, the reliability of this scale was calculated at 0.66 using Cronbach's alpha method.

Cancer Fatigue Scale: The Cancer Fatigue Scale (CFS) was developed by Okuyama et al. (2000). It is a self-report scale for measuring CRF. This scale includes 15 items and the 3 physical, emotional, and cognitive subscales. Its questions are scored on a 5-point Likert scale. Each question obtains a score between 1 (not at all) and 5 (very high). The patient's current condition is marked on this scale (Shun, Beck, Pett, & Berry, 2006).

The minimum and maximum total scores of this questionnaire are 0 and 60, respectively, and higher scores indicate more significant fatigue and vice versa.

Accordingly, the probable degree of fatigue varies between 0 and 28 in the physical dimension, between 0 and 16 in the emotional dimension, between 0 and 16 in the cognitive dimension, and the general fatigue score varies between 0 and 60.

The validity and reliability of this tool were examined in the study conducted by Okuyama et al. (2000), and the results showed that it was a reliable measurement tool. Regarding internal consistency, Cronbach's alpha coefficient was 0.89 in the physical subscale, 0.79 in the emotional subscale, 0.79 in the cognitive subscale, and 0.88 in total scale. In Iran, Haghighat, Montazeri, Akbari, Holakouei Naeini, and Rahimi (2008) calculated the reliability of the CFS and reported it at 0.92, 0.89, 0.85, and 0.95, respectively, for dimensions of physical, emotional, cognitive, and total fatigue, using Cronbach's alpha coefficient. In the present study, the reliability of this scale was calculated at 0.92 using Cronbach's alpha method.

Analysis

The patients completed the demographic characteristics questionnaire before completing the abovementioned questionnaires. SPSS software (version 19; IBM Corp., Armonk, NY, USA) was used to analyze the data. The demographic characteristics of patients and research variables were analyzed using descriptive statistics. Pearson's correlation coefficient and stepwise regression were used to evaluate the correlation of AEE and CRF and their ability to predict adherence to treatment. The statistical results were considered significant at a level of $P \leq 0.05$.

The present study was derived from a plan approved by Isfahan University of Medical Sciences, Iran, with a scientific code of 299061 and a code of ethics of IR.MUI.MED.REC.1400.169. It was conducted from April to June 2020.

Table 1. Descriptive results of research variables

Statistical indices	Mean	SD	Minimum	Maximum
Ambivalence over emotional expression	75.66	14.73	39	118
Cancer-related fatigue	25.48	13.60	2	60
Adherence to treatment	22.70	4.67	12	30

SD: Standard deviation

Results

According to the obtained data, the mean age of patients in the present study was 44.90 years, and their level of education varied from diploma to master’s degree. In terms of gender, 15% of them were female, and 85% of them were male. Moreover, 82% of the patients reported metastasis, and 40.3% had a family history of cancer. Regarding disease status, at the time of diagnosis, 11.2% were in stage 1, 46.1% were in stage 2, 35.4% were in stage 3, and 7.3% were in stage 4. Regarding socio-economic status, 59.7% reported a moderate level, 6.8% reported a deficient level, and 1.9% reported a high level. Table 1 presents descriptive results related to research variables.

As can be seen in table 1, the highest mean among the three variables is related to AEE (75.66). Furthermore, the mean of the CRF variable is 25.48, and the mean of the adherence to treatment variable is 22.70. The Pearson correlation coefficient was used to investigate the correlation of AEE and CRF with adherence to treatment, the results of which are presented in table 2.

As the results presented in table 2 show, there is a significant negative relationship between AEE and adherence to treatment ($r = -0.184$; $P \leq 0.01$) and between CRF and adherence to treatment ($r = -0.173$; $P \leq 0.05$). Then, stepwise regression was used to predict the score of AEE and CRF based on adherence to treatment, the results of which are presented in tables 3 and 4.

As the results of model analysis of variance (ANOVA) show, the obtained regression model is significant at the level of $P < 0.01$, and CRF and AEE variables predict a total of 4% of adherence to treatment in cancer patients ($R^2 = 0.048$).

As can be seen in table 4, the beta value obtained for the AEE variable is -0.045, which is significant at $P \leq 0.05$ given the t-statistic ($t = -1.987$).

Discussion

The present study evaluated the relationship of AEE and CRF with adherence to treatment in cancer patients. The results showed that AEE and CRF have a negatively significant relationship with adherence to treatment, and increasing fatigue and AEE can reduce adherence to treatment in cancer patients. In addition, the two variables of AEE and CRF predicted 4% of treatment adherence in cancer patients.

Table 2. Results of the correlation coefficient of ambivalence over emotional expression and cancer-related fatigue with adherence to treatment

Variable	AEE	CRF	Adherence to treatment
1	1		
2	0.321**	1	
3	-0.184**	-0.173*	1

AEE: Ambivalence over emotional expression; CRF: Cancer-related fatigue

* $P \leq 0.05$; ** $P \leq 0.01$

Table 3. Results of stepwise regression of ambivalence over emotional expression and cancer-related fatigue with adherence to treatment

Model	Variable	Indices							
			SS	df	MS	F	P	R	R ²
Step 1	Cancer-related fatigue, ambivalence over emotional expression	Regression	216.914	2	108.457	5.169	0.006	0.220	0.048
		Residual	4259.610	203	20.983				
		Total	4476.524	205					

SS: Sum of squares; df: Degree of freedom; MS: Mean square

These findings are in line with those of previous researches by Ramesh, Ghazian, Rafiepoor, and Safari (2018), Bashiri Nejadian et al. (2021), Nadrian, Hosseini, Basiri, and Tahamoli (2019), and Vorobiof et al. (2018).

AEE and CRF can have a mutual relationship. Because a person suffering from a chronic disease such as cancer not only experiences much physical fatigue caused by medication and treatment, but also suffers from emotional and psychological fatigue.

Various aspects of disease fatigue can negatively affect the patient's sense of security and certainty in decisions, and finally, the patient becomes ambivalent in multiple elements, including the expression of emotions. This ambivalence and lack of emotional regulation in difficult and prolonged conditions of the disease can impose a tremendous psychological burden on the patient. This leads to an experience of more dynamic and cognitive fatigue besides fatigue caused by the disease and treatment.

Research has also shown that there is a direct relationship between disease-related characteristics and emotional disturbance, cancer fatigue, and cognitive performance in cancer patients (Shariati, 2021).

As for the relationship between the two variables of AEE and adherence to treatment, our research showed a significant negative relationship between AEE and adherence to treatment. This finding is in line with that of previous research by Ramesh et al. (2018) and Bashiri Nejadian et al. (2021). An explanation for this finding is that, as researchers have shown, individuals with cancer experience a high level of AEE compared to healthy individuals (Ji, 2019). Indeed, the disease can lead to emotional dysregulation and AEE in patients. The suppression of emotions and lack of expression of feelings results in the lack of acceptance of the illness and relevant emotions, and this can lead to reduced self-care behaviors and adherence to treatment in patients.

Research has also shown that treatments based on regulating and correcting emotions can increase cancer patients' self-care behaviors (Tabibzadeh, soleimani, & Ghorban Shiroodi, 2022).

Table 4. Stepwise regression coefficients of ambivalence over emotional expression and cancer-related fatigue with adherence to treatment

Variable	Coefficient B	Standard error	Beta coefficient	t	P
Constant	27.217	1.652		16.470	0.001
Ambivalence over emotional expression	-0.045	0.023	-0.144	-1.987	0.048
Cancer-related fatigue	-0.044	0.025	-0.127	-1.756	0.081

AEE, in the long term, can lead to feelings of anger, despair, depression, loneliness, disruption in interpersonal relationships, and even feelings of guilt and frustration in patients (Bashiri Nejadian et al., 2021; Alavi et al., 2017). These negative emotions destroy the patient's beliefs, knowledge, and health-oriented behaviors and reduce or disrupt their adherence to the treatment.

Our findings on the relationship between CRF and treatment adherence align with previous research findings by Nadrian et al. (2019) and Vorobiof et al. (2018).

This finding can be explained by the fact that CRF affects patients physically, cognitively, and emotionally and leads to lack of energy, dysfunction, impaired concentration and attention, an increase in cognitive errors, and a decrease in motivation (Weis & Horneber, 2015; Schottker et al., 2020). These factors, both behaviorally and negatively impacting the patient's beliefs and views about the disease, treatment, and treatment results, can lead to a decrease in motivation and adherence to the treatment. Research has also shown an inverse and significant relationship between self-care behaviors and adherence to treatment and fatigue in patients (Nadrian et al., 2019), and greater fatigue in patients is associated with less adherence to treatment. Fatigue in cancer patients can also lead to a delay in the continuation of treatment, stopping or changing treatment, and poor adherence to treatment (Vorobiof et al., 2018).

The results showed that **ambivalence in expressing excitement** and CRF cannot predict patients' adherence to treatment. According to the theories, these two variables are expected to have more impact. A reason for this finding can be the demographic characteristics of the disease and those of the patients in the current study, including the unique history of metastasis, different cancers, and differences in the stage of the disease at the time of diagnosis, and even the patients' culture. All of these factors affect the beliefs and knowledge of the patients, their attitude to their disease, and their expression or non-expression of emotion and disease fatigue. Research has also shown that trust in treatment and belief in the effectiveness of treatment has a direct relationship with adherence to treatment (Te Paske, Vervloet, Linn, Brabers, van Boven, & van Dijk, 2023). Adherence to treatment can also be associated with factors such as treatment costs, insurance support for patients, availability of medical services, health literacy of patients, and the effectiveness of previous treatments. AEE and CRF may exert their effect on treatment adherence through these mediating variables.

Despite all the researchers' efforts to be accurate in all stages of the research, this research had some limitations. Among the main limitations, it can be mentioned that the sample of cancer patients was limited to one center in Isfahan City, and also, the sample of patients in the present study included patients with all types of cancer. Thus, the generalizability of the results should be done with caution. In this regard, it is suggested that patients from other cities and cultures be studied in future research. It is also recommended that in future research, the role and performance of each of the variables of the present research in each type of cancer be investigated as a unit.

Moreover, due to the high prevalence and risk of coronavirus, data collection in the present study was done online, and due to some patients' lack of access to and familiarity with the Internet, some patients who met the study inclusion criteria were not included in the study. Furthermore, there was not much research background about the research variables inside and outside the country. Therefore, the possibility of comparing the results of this research with other research conducted in this field was limited.

Conclusion

According to our results, lack of emotional regulation in patients, conflict in expressing or not expressing emotions, and disease-caused physical and emotional fatigue can have a significant effect on adherence to medication and treatment orders in patients. The research results suggest that healthcare workers and treatment staff should pay special attention to the importance of treatment adherence, and provide appropriate therapeutic and psychological training and support to patients and their families to improve treatment adherence. They should also take advantage of methods such as expressive therapies, cognitive-behavioral interventions such as relaxation, cognitive reconstruction, and supportive counseling to increase the ability of patients to recognize and express their emotions and feelings, to promote self-expression, and create empathic relationships in order to reduce AEE and CRF.

Conflict of Interests

Authors have no conflict of interests.

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