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Comparing Symptoms of Anxiety Disorders and Related Transdiagnostic Factors in Cancer Patients and Healthy Individuals

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ABSTRACT

Introduction:
This study aimed to compare symptoms of anxiety disorders and related transdiagnostic factors in cancer patients and healthy individuals.

Materials and Methods:
In this causal-comparative study, 30 patients with cancer and 30 healthy individuals were selected by the convenience sampling method. The groups were matched in demographic characteristics with each other. The participates completed the Generalized Anxiety Disorder Scale-7 (2006), Severity Measure for Panic Disorder-Adult (2013), Social Phobia Inventory (2000), Cognitive Avoidance Questionnaire (2008), Intolerance of Uncertainty Scale (1994), Metacognition Questionnaire (2004), Acceptance and Action Questionnaire-II (2011), and Cognitive Emotion Regulation Questionnaire (2006). Data were analyzed by SPSS software (version 24), using a one-way analysis of variance. The significance level was 0.05.

Results:
The results showed that there was a significant difference between the two groups in symptoms of generalized anxiety (GAD) and panic disorders (PD) ($P<0.05$). However, no significant difference was observed in symptoms of a social anxiety disorder ($P>0.05$). In addition, there was a significant difference between the two groups in all transdiagnostic factors ($P<0.05$).

Conclusion:
Individuals with cancer were reported more symptoms of GAD and PD and related transdiagnostic factors than those in the control group.

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Introduction

Cancer, as one of the causes of death worldwide (1), is a group of diseases characterized by uncontrolled growth and abnormal spread of cells. They can affect any part of the body and their abnormal expansion can lead to mortality (1,2). Cancer consists of various types; however, breast, esophagus, stomach, intestine, and cervical cancers are the five most common types in Iranian females. On the other hand, gastric, esophagus, intestine, bladder, and blood cancers are the five most prevalent types of cancers in Iranian males (3). Substance use, diet, and physical inactivity are among the main causes of cancer (1,2). These days,

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advances in the identification and therapy of cancer have led to the promotion of the life expectancy of individuals with this disorder (4). In addition, the burden of cancer can be reduced by changing or avoiding risk factors, such as smoking, overweight or obesity, unhealthy diets without fruits and vegetables, physical inactivity, alcohol consumption, urban air pollution, ionizing and non-ionizing radiations, hepatitis or other carcinogenic infections, and sexually transmitted human papillomavirus infection (1). The patients with cancer suffer from various physical consequences (e.g., fatigue, dyspnea, musculoskeletal problems, neurological disease, poor bowel and urinary control, pain, sleep and endocrine problems, increased risk of common chronic diseases (e.g., stroke and osteoporosis), and psychological outcomes (e.g., negative thoughts, cognitive impairment, adjustment disorder, fear of disease recurrence and death, loneliness, suicidal thoughts, depression, and sexual and body image problems) (4-7). Other outcomes of cancer are anxiety disorders and related transdiagnostic factors. Common features of anxiety disorders are fear, anxiety, and related behavioral disturbances, many of which start during childhood and tend to be persistent if not untreated (8).

Generalized anxiety disorder (GAD) and panic disorder (PD) are the most prevalent anxiety disorders among medical diseases (9). The prevalence of anxiety disorder among people with cancer is in the range of 10.3%-18.4% (7,10,11). Spencer et al. (12) reported that 7.6% of advanced cancer patients had diagnostic criteria of anxiety disorders. Furthermore, 3.2%, 0.3%, and 0.3% of them have the symptoms of posttraumatic stress disorder, GAD, and PD, respectively.

Anxiety disorders are associated with a series of transdiagnostic factors. The transdiagnostic approach comprises pathological processes that are common in several mental disorders (13). The intolerance of uncertainty (IU) is a dispositional characteristic that results from a set of negative beliefs about uncertainty and its implications. It is also considered a cognitive vulnerability for high worry and anxiety (14). The negative beliefs about worry (NBV) refer to the beliefs that lead to the negative appraisal of the worry process as uncontrollable and dangerous (15). Cognitive avoidance is applied to various implicit and explicit strategies that lead to avoiding threatening cognitive and emotional content (14).

Experiential avoidance is defined as an attempt to avoid, control, or change threatening internal experiences (16). Emotion regulation is comprised of processes that are responsible for monitoring, evaluating, and modifying emotional responses to achieve goals (17). Emotion dysregulation refers to the patterns of emotional experience or expression that interfere with goal-directed activity (18). Cognitive emotion regulation strategies are defined as the cognitive responses of people to emotion-eliciting events (19). These strategies are important for managing and regulating emotions or feelings, controlling emotions, or not getting overwhelmed by them (20,21). Although the literature review revealed that no study has comprehensively examined the transdiagnostic factors associated with anxiety disorders in individuals with cancer, Gillanders et al. (22) found a correlation between cognitive avoidance and anxiety among cancer patients. Based on the results of a study conducted by Coke et al. (23), the metacognitive beliefs before treatment (NBV and cognitive confidence) predicted anxiety symptoms 12 months after treatment. Ghanbari et al. (24) reported that there is a significant difference in the metacognitive beliefs (e.g., NBV) between women with breast cancer and healthy females.

Eisenberg et al. (25) found a significant relationship between IU and cancer-related distress of treated patients with prostate cancer (after 3-5 years of treatment). Salber (26) indicated that there was a relationship between experiential avoidance and anxiety in people with breast cancer. Azizi et al. (27) reported a significant difference between individuals with gastric and lung cancer and controls in maladaptive cognitive emotion regulation strategies (i.e., rumination, catastrophizing, self-blame, and other-blame). Considering the great prevalence of cancer and related consequences (1,2), the role of transdiagnostic factors in clinical and

non-clinical disorders, especially cancers, and limited study performed in this field, the current study aimed to compare the symptoms of anxiety disorders and related transdiagnostic factors in cancer patients and healthy individuals.

Materials and Methods

This fundamental study was conducted based on the causal-comparative (ex post facto) research design. The population included all cancer patients in Mashhad city, Iran, and the samples consisted of 30 cancer patients referring to Imam Reza Hospital, Mashhad, Iran, and 30 healthy individuals (caregivers and personnel of Imam Reza Hospital) selected using the convenience sampling method. The research sample was a heterogeneous group of patients with breast (n=12), prostate (n=2), liver (n=2), stomach (n=3), colon (n=5), lymph (n=3), rectum (n=2), and esophagus (n=1) cancers. Data were analyzed in SPSS software (version 24) using one-way analysis of variance (ANOVA). The significance level was 0.05.

Generalized Anxiety Disorder Scale-7:

The Generalized Anxiety Disorder Scale-7 (GAD-7) is a 7-item self-report scale used to diagnose GAD and evaluate the intensity of clinical symptoms. The items are scored on a 4-point Likert scale (from 0=not at all to 3=nearly every day). This scale demonstrated excellent internal consistency (α=0.92) and good test-retest reliability (r=0.83). Moreover, it has been reported to have a good validity (28). In a study performed by Mansouri et al., the Cronbach's alpha and split-half reliability were estimated at 0.89 and 0.74, respectively. The confirmatory factor analysis demonstrated a good fit on all indices (29). In the current study, GAD-7 demonstrated excellent internal consistency (α=0.944).

Social Phobia Inventory:

The Social Phobia Inventory (SPIN) is a 17-item self-report inventory. The items are rated on a 5-point Likert scale (from 0=not at all to 4=extremely). The internal consistency of this instrument in clinical and non-clinical populations was reported from 0.82 to 0.94 (30). The SPIN demonstrated excellent internal consistency (α=0.97) and good test-retest reliability for the Persian version. Additionally, this inventory has a good convergent validity (31). In the current study, Cronbach's alpha coefficient was obtained at 0.935. Severity Measure for Panic Disorder-Adult: This 10-item scale is a self-report to measure the intensity of symptoms of PD in people aged 18 and older. The replies are scored on a 5-point Likert scale (from 0=never to 4=all of the time) (32). In the current study, the internal consistency was excellent (α=0.905).

Cognitive Avoidance Questionnaire:

This 25-item self-reported questionnaire is scored on a 5-point Likert scale (from 1=not at all typical to 5=completely typical). It consists of five subscales, including thought suppression, thought substitution, distraction, avoidance of threatening stimuli, and transformation of images into thoughts. The Cognitive Avoidance Questionnaire has demonstrated excellent internal consistency (α=0.95) and good test-retest reliability (r=0.85) (33). In the study carried out by Mansouri et al., the Cronbach's alpha coefficient and split-half reliability were estimated at 0.89 and 0.69, respectively. The confirmatory factor analysis demonstrated a good fit on all indices (29). In the current study, the internal consistency was excellent (α=0.943).

Intolerance of Uncertainty Scale:

This 27-item scale is a self-report that assesses an individual's emotional, cognitive, and behavioral reactions in uncertain situations. The items are scored based on a 5-point Likert type scale (from 1=not at all characteristic of me to 5=entirely characteristic of me). The internal consistency of this tool was reported to be excellent (α=0.91). This scale correlated with the Penn State Worry Questionnaire (r=0.63) and the Worry Domains Questionnaire (r=0.57) (34). In the study conducted by Mansouri et al., the Cronbach's alpha coefficient and split-half reliability were calculated at 0.93 and 0.81, respectively. The confirmatory factor analysis demonstrated a good fit on all indices (29). In the current study, the internal consistency of this instrument was excellent (α=0.934).

Metacognition Questionnaire:

This 30-item questionnaire is a self-report tool evaluating metacognitive beliefs, such as negative beliefs about worry. The items are scored on a 4-point Likert scale (from 1=do not agree to 4=agree very much). The Cronbach's alpha coefficient for total score and subscales were obtained at a range of 0.72-0.93. The test-retest reliability for the total score was estimated at 0.75 (35). In the current study, the internal consistency was calculated at 0.837.

Cognitive Emotion Regulation Questionnaire:

This 18-item self-report is scored on a 5-point Likert scale (from 1=almost never to 5=almost always), and contains nine subscales or strategies. These strategies are divided into adaptive (i.e. refocus on planning, positive reappraisal, positive refocusing, and acceptance) and maladaptive (i.e., self-blame, rumination, blaming others, and catastrophizing). Internal consistency scores for subscales were reported at the range of 0.67-0.81. In addition, the validity of this tool was found to be good (20). The Cronbach's alpha coefficient of the Persian version of the subscales was reported 0.66 to 0.88. Furthermore, internal consistencies for adaptive and maladaptive strategies were also reported at 0.82 and 0.74, respectively (29). In the current study, the internal consistency scores for adaptive and maladaptive were obtained at 0.87 and 0.781, respectively.

Acceptance and Action Questionnaire-II: This is a 7-item self-report questionnaire that is scored based on a 7-point Likert scale (1=never true to 7=always true). The mean internal consistency of this instrument was reported at 0.84 (0.78-0.88). Its test-retest reliability (0.81 and 0.79) was found to be appropriate (36). In the study performed by Mansouri et al., the Cronbach's alpha coefficient and split-half reliability were 0.85 and 0.60, respectively. The confirmatory factor analysis demonstrated a good fit on all indices. In the current study, the internal consistency was good (0.804).

Results

Demographic data, mean, and standard deviation of the variables are presented in tables 1 and 2.

Table 1. Demographic data for cancer patients and healthy individuals

Group	Age		Marital status		Education status					Social class					Occupational status		
	Mean	SD	Single	Married	High school	Diploma	Associate's degree	Bachelor's degree	Master's degree	Low	Moderate-low	Moderate	Moderate-high	High	Employed	Unemployed	Retired
Cancer patients	43.30	11.59	3	27	13	9	2	5	1	5	11	13	1	0	10	16	4
Healthy individuals	40.33	13.76	7	23	5	7	4	10	4	3	6	16	5	0	17	8	5
Total	41.82	12.70	10	50	18	16	6	15	5	8	17	29	6	0	27	24	9

The mean age scores of people with cancer and healthy individuals were 43.30±11.59 and 40.33±13.76 years, respectively.

There was no difference in the mean scores of age (df=58, F=0.82, P>0.05) and marital status (χ^2=0.17, P>0.05), educational status (χ^2=0.09, P>0.05), social class (χ^2=0.18, P>0.05), and occupational status (χ^2=0.10, P>0.05) between the two groups. To address the hypothesis of this study, ANOVA was conducted (Table 3).

Table 2. Descriptive indexes for the variables in both groups

Variables	Group				Variables	group			
	Cancer patients		Healthy			Cancer patients		Healthy	
	Mean	SD	Mean	SD		Mean	SD	Mean	SD
Generalized anxiety	15	6.73	6.83	5.27	3. Positive refocus on planning	7.17	2.86	7.33	1.78
Social anxiety	21.93	17.16	17.97	13.21	4. Positive reappraisal	6.80	2.99	7.27	1.96
Panic disorder	16.97	10.21	7.57	6.90	5. Putting into perspective	5.87	2.76	6.80	1.78
Cognitive avoidance	85.37	21.55	65.23	22.74	Adaptive cognitive emotion regulation	32.07	10.35	33.30	7.35
Intolerance of uncertainty	83.40	21.30	72.43	20.88	1. Self-blame	4.37	2.68	4.93	2.25
Negative beliefs	18.37	4.85	12.53	3.64	2. Rumination	8.33	2.35	5.93	2.47
Experiential avoidance	29.80	12.13	20.03	9.89	3. Catastrophizing	7.27	2.57	5.17	2.35
1. Acceptance	6.50	2.47	6.50	2.28	4. Blaming others	5.90	3.46	5.03	2.67
2. Positive refocusing	5.73	2.85	5.40	2.06	Maladaptive cognitive emotion regulation	25.87	5.93	21.07	7.64

Table 3. Anxiety disorder symptoms and related transdiagnostic factors in cancer patients and healthy individuals

Variables	SS	df	F	P	Variables	SS	df	F	P
Generalized anxiety	1000.41	1	27.31	0.0001	3. Positive refocus on planning	0.41	1	0.07	0.78
Social anxiety	236.01	1	1.08	0.30	4. Positive reappraisal	3.26	1	0.50	0.48
Panic disorder	1325.40	1	17.44	0.0001	5. Putting into perspective	13.06	1	2.41	0.12
Cognitive avoidance	6080.26	1	12.38	0.001	Adaptive cognitive emotion regulation	22.81	1	0.28	0.60
Intolerance of uncertainty	1804.01	1	4.05	0.049	1. Self-blame	4.81	1	0.78	0.38
Negative beliefs	510.41	1	27.70	0.0001	2. Rumination	86.40	1	14.80	0.0001
Experiential avoidance	1430.81	1	11.67	0.001	3. Catastrophizing	66.15	1	10.90	0.002
1. Acceptance	0	1	0	1	4. Blaming others	11.26	1	1.17	0.28
2. Positive refocusing	1.66	1	0.27	0.60	Maladaptive cognitive emotion regulation	345.60	1	7.37	0.009

The results of Table 3 exhibit a considerable difference between cancer patients and healthy individuals in symptoms of GAD and PD (P<0.05). There is no difference between them in the symptoms of seasonal affective disorder (SAD) (P>0.05). A significant difference was observed between the two groups in all transdiagnostic variables, including cognitive and experiential avoidance, maladaptive cognitive emotion regulation, NBV, and IU (P<0.05). The study of adaptive and maladaptive strategies showed that there was no difference between them, except for rumination and catastrophizing strategies (P<0.05).

Discussion

The current research aimed to compare the symptoms of anxiety disorders and related transdiagnostic processes in cancer patients and healthy individuals. The results showed that people with cancer experienced more symptoms of GAD and PD than healthy

individuals. However, there was no difference between them regarding the symptoms of SAD. The findings of previous studies have shown that GAD and PD are the most important anxiety disorders linked with medical illness (9).

The prevalence of anxiety disorders among individuals with cancer is in the range of 10.3-18.4 (7,10,11). Spencer et al. (12) reported that 6.7% of advanced cancer patients had diagnostic criteria of anxiety disorder. Moreover, 3.2%, 0.3%, and 0.3% of such patients had criteria for posttraumatic stress, generalized anxiety, and panic disorder, respectively. In this regard, the findings of the present study showed that individuals with cancer experienced more symptoms of GAD and PD. These results suggest that cancer is a stressful life event that leads to adverse physical and mental effects, impaired functions, and anxiety disorder symptoms (e.g., GAD and PD) in people with this disorder. Some factors can contribute to experiencing the symptoms of anxiety disorders, such as chemotherapy complications, prolonged hospitalization, loss of physical activity, changes in appearance, changes in relationships with others, impaired social roles and functions, reduced support, impaired concentrate, sleep problems, and negative repetitive thoughts about the future, illness relapse, and loss of life.

Based on the results, cancer patients experienced more transdiagnostic factors associated with anxiety disorders. In other words, they encountered more cognitive and experiential avoidance, NBV, and IU. They also used maladaptive emotion regulation strategies, including rumination and catastrophizing.

However, there was no difference in the adaptive emotion cognitive regulation strategies between the two groups. The findings of the current research are consistent with those of previous studies showing that people with cancer experience more cognitive and experiential avoidance, IU, NBV, and maladaptive emotion regulation strategies. Gilandres et al. (22) found a correlation between cognitive avoidance and anxiety in individuals with cancer. Coke et al. (23) reported that the NBV could predict the anxiety symptoms 12 months after treatment. Ghanbari et al. (24) showed that a significant difference in the metacognitive beliefs (e.g., NBV) between breast cancer and healthy individuals.

Eisenberg et al. (25) found a significant relationship between IU and cancer-related distress of cured patients with prostate cancer (after 3-5 years of treatment). Experiential avoidance and anxiety were found to be correlated in people with breast cancer (26). Azizi et al. (27) reported a significant difference between gastric and lung cancer and normal individuals in maladaptive cognitive emotion regulation strategies (i.e., catastrophizing, self-blame, rumination, and blaming others). The findings of the present research also showed that transdiagnostic factors occurred in various mental and physical disorders and clinical and general populations and their occurrence was not limited to any psychological disorders. In explaining the above results, it can be said that the transdiagnostic factors through different processes lead to the exacerbation and maintenance of psychological problems, such as anxiety disorders. Cognitive avoidance helps people avoid their threatening cognitive and emotional content (e.g., worry) related to their illness (14). However, cognitive avoidance not only can decrease worry but also leads to an increase and maintenance of worry levels in people with cancer. Intolerance of uncertainty can have effects on perception, interpretation, and response to ambiguous situations. It is also considered as a cognitive vulnerability for high worry and anxiety levels (14).

Therefore, cancer and its physical and psychological problems, as stressors, can result in uncertainty in patients. On the other hand, IU can increase their worry and anxiety. Experiential avoidance also makes it possible to avoid, control, or modify their threatening or negative inner experiences (e.g., thoughts, feelings, and memories) in an active or automated way (16).

Consequently, people with cancer are likely to use various strategies, such as worry, to avoid this cognitive and emotional content or threatening experiences, which in turn, cause an increase in symptoms associated with their diseases and anxiety disorders.

The NBV includes the beliefs in which the worry is uncontrollable and harmful to the body, mind, or psychosocial functions (15). People with cancer are driven by this kind of negative belief about their worries towards a persistent and inflexible defective cycle of processing negative thoughts and emotions about their illness. Ultimately, this factor can exacerbate the feeling of the threat and symptoms of anxiety and, as a result, lead to the maintenance and aggravation of the disease. Finally, the cognitive emotion regulation strategies refer to the cognitive responses of people to emotion-eliciting events (19). Moreover, these strategies are important for managing and regulating emotions or feelings and controlling emotions (20,21). The use of maladaptive strategies, such as rumination and catastrophizing, by people with cancer, indicates their significant defects in experience and emotion regulation; a factor that causes their anxiety and worry, and consequently, leads to the exacerbation and maintenance of their current condition.

One of the limitations of the current cross-sectional study was related to the fact that it was conducted on a heterogeneous group of cancer patients. Regarding this, the generalization of the findings to other groups should be performed with caution. The performance of longitudinal studies and research on homogeneous groups and other clinical populations can provide more information in this area. Secondly, variables were measured by self-report instruments. Therefore, future studies are recommended to use other tools and evaluation methods, such as interviews, to provide access to more accurate and valid results.

Thirdly, this study was conducted as a pilot on 30 cancer patients; accordingly, further studies can be carried out on a larger sample size. Ultimately, although it was tried to use short forms of tests in this research, the number of instruments seemed to be high for these people.

Conclusion

The findings of the current research indicated that individuals with cancer experienced the symptoms of GAD and PD and, more severely than others, related transdiagnostic factors. Therefore, anxiety disorders and related transdiagnostic factors need to be considered in cancer patients. Furthermore, it is necessary to pay attention to psychological therapies, such as transdiagnostic treatment, along with other medical therapies. Finally, the results of this study help to develop a transdiagnostic treatment for people with cancer.

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