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A Comparison of Personality Characteristics between Patients with Cancer and the Control Group

Kanser Hastalarının Kişilik Özelliklerinin Kontrol Grubu ile Karşılaştırılması

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ABSTRACT

Aim: It is known that personality can affect most of the issues related to physical and mental health. It is thought that some personality features carry importance as a factor in cancer development, and therefore, the theory of a cancer-prone personality continues to attract researchers' attention. The aim of this study is to investigate and compare the differences in personality characteristics between patients with different types of cancer and healthy control group.
Material and Methods: A total of 193 participants, patients with different types of cancer (n=100) and healthy individuals as the control group (n=93), were included in this study. Hacettepe Personality Inventory (HPI) was used to obtain the data related with personality traits.
Results: The mean score of self-realization (SR) and emotional stability (ES), which are personal adaptation subscales of the HPI, was found to be significantly lower in cancer group compared to control group (p=0.016 and p=0.009). As a result of further analyses performed according to cancer types, it was found that both SR and ES scores in head-neck cancer group were lower than both control group and other subgroups of cancer types (p=0.004 and p=0.001).
Conclusion: The results of this study revealed that there are differences between cancer and control groups in terms of personality characteristics. Overall, it was thought that the personality characteristics that are unique to patients with head-neck cancers may be the reactions that appear as a result of the development of head-neck cancer rather than a significant factor in cancer development.
Keywords: Cancer; personality; personality characteristics; Hacettepe Personality Inventory.

ÖZ

Amaç: Kişiliğin hem fiziksel hem de ruhsal sağlıkla ilişkili pek çok faktör üzerinde etkili olabildiği bilinmektedir. Bazı kişilik özelliklerinin kanser gelişiminde de bir faktör olarak önem taşıdığı düşünülmekte ve bu nedenle de kansere yatkın kişilik kavramı araştırmacıların ilgisini çekmeye devam etmektedir. Bu çalışmanın amacı, farklı türden kanser hastaları ile sağlıklı kontrol grubu arasındaki kişilik özelliklerindeki farklılıkları incelemek ve karşılaştırmaktır.
Gereç ve Yöntemler: Bu çalışmaya farklı türden kanser tanısı olan hastalar (n=100) ve kontrol grubu olarak da sağlıklı bireylerden (n=93) oluşan toplam 193 kişi dahil edilmiştir. Kişilik özellikleri ile ilgili verilerin elde edilmesi için Hacettepe Kişilik Envanteri (HKE) kullanılmıştır.
Bulgular: HKE'nin kişisel uyum alt ölçeklerinden olan Kendini Gerçekleştirme (KG) ve Duygusal Kararlılık (DK) puan ortalamalarının kontrol grubu ile karşılaştırıldığında, kanser grubunda anlamlı şekilde daha düşük olduğu bulunmuştur (p=0,016 ve p=0,009). Kanser türlerine göre yapılan ileri analizler sonucunda ise, baş boyun kanseri alt grubunda hem KG hem de DK puanlarının, hem kontrol grubundan hem de diğer kanser türlerine sahip alt gruplardan daha düşük olduğu görülmüştür (p=0.004 ve p=0.001).
Sonuç: Bu çalışmanın sonuçları, kanser grubu ve kontrol grubu arasında kişilik özellikleri açısından farklılıklar olduğunu ortaya koymaktadır. Genel olarak, baş boyun kanserli hastalara özgü kişilik özelliklerinin kanser gelişiminde önemli bir faktör olmaktan ziyade, baş boyun kanseri gelişimi sonucu ortaya çıkmış olan tepkiler olabileceği düşünülmüştür.
Anahtar kelimeler: Kanser; kişilik; kişilik özellikleri; Hacettepe Kişilik Envanteri.

INTRODUCTION

Cancer, one of the foremost health problems of the age, has taken on greater significance in preventive health services due to the increase in the incidence of this disease (1,2). While cancer was ranked as 7th and 8th among the diseases causing death by the early part of this century, it is today ranked 2nd, following cardiac diseases, in many countries including Turkey (1,3). Cancer is a chronic disease, which symbolizes death and limited control over life. In other words, cancer is the symbol of an unknown danger, suffering, pain, guilt, shame, isolation, chaos, and anxiety (1,4). Because life expectancy has increased, cancer has become one of the chronic health problems nowadays. In response to this threat, there have been innovations in diagnosis and treatment methods, increased use of healthcare organizations, and developments in the diagnosis and treatment of many acute and chronic disease (2,4). Ateşçi et al. (5) define cancer as a persistent and terminal disease as well as an important problem causing emotional, mental, and behavioral reactions.

The concept of personality involves the adaptive traits that are particular to an individual and that distinguish him or her from others. These traits include perception, mentality, and behavior patterns that are developed for the adaptation to the inner and external world based on cognitive evaluations. Individuals with these behavior patterns have the ability to display particular emotional reactions in particular situations and are equipped with coping and defense mechanisms to deal with inhibition and conflict. In other words, personality is the dynamic organization of psychophysical systems determining an individual's behavior and thoughts. Personality has two main components, temperament and character. While the character is defined as individuals' view and perception of life and their survival skills, temperament is defined as individuals' inborn behavioral tendencies, which are more inherently biological (6).

It is thought that some personality features carry importance as a factor in cancer development. The theory of a cancer-prone personality continues to attract researchers' attention, and many studies have been conducted in this field. While some of these studies supported this theory, others revealed contradictory results (7-16). For instance, Dattore et al. (10) compared premorbid personality traits between cancer patients and healthy controls by using the Minnesota Multiphasic Personality Inventory (MMPI). They found that cancer patients premorbid displayed lesser repression and much more self-reported depression than healthy individuals in the control group. Moreover, You et al. (16) investigated personality, coping strategies, and survives of Chinese cancer patients. They proposed that personality traits have an effect on survives of cancer patients by the linkage with the relationship between coping strategies and personality traits.

There are several studies in the literature, which compare personality characteristics between different types of cancer by using different personality inventories (7-16). We could not find any study, which compares several cancer types by using a current personality inventory in a single study. The aim of this study is to investigate and compare the differences in personality characteristics between patients with different types of cancer and the control group consisting of healthy individuals.

MATERIAL AND METHODS

Participants

The participants in the cancer group were selected from individuals with a diagnosis of cancer who received treatment in the Oncology Department of four different university hospitals between the years 2010 and 2011. To determine the sample size of this study, we looked at similar studies in the literature that suggested the number of participants for determining the difference between groups as at least 70 participants for each group with 5% significance level and 80% power. In terms of sampling type, we used purposive sampling with the following criteria for selecting the participants: the capability to understand and answer the scale accurately and a minimum of a primary education. The participants took part in the study on a volunteer basis. Researchers followed principals of Declaration of Helsinki for the ethical rules about participants in this study. Moreover, an informed consent was taken from each participants after informing them to participate in this research. The ethical permission for this study was obtained from the Ethical Committee of Düzce University Medical Faculty with the number of 2011/238 at 27.01.2012 before data collection.

The participants were asked about eight socio-demographic parameters including age, gender, educational level, marital status, income status, place of residence, and family type. After completing the exclusion process based on the aforementioned criteria, a total of 100 patients (50 females, 50 males) constituted the cancer group. A total of 93 healthy volunteers (47 females, 46 males) with similar sociodemographic characteristics constituted the control group.

Instruments

Hacettepe Personality Inventory (HPI): The HPI, an inventory developed by Özgüven İE (17) in 1992 in order to determine individuals' personal and social adaptation level, was used in the study. As a result of reliability studies conducted on various groups by applying the inventory, reliability coefficients were calculated ranging from 0.58 to 0.92 with an average of 0.82. The HPI consists of 8 subscales; four of them constitute the personal adaptation section, and the other four constitute the social adaptation section. Each subscale consists of 20 questions, and the validity scale consists of 8 questions, therefore, the HPI, in total, consists of 168 questions. The following four subscales were used to measure personal adaptation: the subscale of Self-Realization (SR), which investigates self-confidence, self-awareness of the skills, self-determination, self-expression, and the feeling of acceptance and usefulness; the subscale of Emotional Stability (ES), which determines the level of emotional determination; the subscale of Neurotic Tendencies (NT), which indicates the disposition to neurotic tendencies; and the subscale of Psychotic Symptoms (PS), which indicates the disposition to psychotic symptoms. In order to measure social adaptation, the following four subscales were used: the subscale of Family Affairs (FA), which measures individuals' skills of communication within their families; the subscale of Social Relations (SRe), which indicates the quality of their relationship with people other than family members; the subscale of Social Norms (SN), which measures the characteristic of being respectful to social principles, the values of the society, and others' rights as

well as legal obligations; and the subscale of Antisocial Tendencies (AT), which indicates whether an individual has antisocial tendencies. The lower scores taken from any sub-scale of HPI show a lower level of adaptation than expected. In other words, lower scores indicate higher defined characteristics and lower level of adaptation according to the norms of the society (17).

Statistical Analysis

PASW (SPSS 18.0.) software was used for the statistical analyses. The normality hypothesis of continuous quantitative variables was examined by Shapiro Wilk test and homogeneity control of variances was examined by Levene test. The descriptive statistics such as mean, standard deviation, and number and percentage frequencies regarding the data obtained are presented in tables. Either One Way Variance Analysis or a Chi-Square test was used based on its appropriateness in order to compare the demographic characteristics of the groups. Covariance analysis was used to examine the differences between the HPI scores of both groups. Since the demographic characteristics are thought to have an influence on the scores, demographic characteristics were taken as the covariant, thus, their effect on the scores was eliminated. Statistical significance level was considered as 0.05, and post hoc Tukey test was used to indicate the significance.

RESULTS

Regarding socio-demographic characteristics of groups, no significant difference was found between the groups according to the variables of age, gender, educational level, marital status, place of residence, and family type. The results revealed a significant difference just for income status between the groups (p=0.005). Half of the cancer patients were male in the cancer group, 59% was over 50 years old and 87% was married. Three-fourths had a primary education degree; half lived in a city, and approximately two-thirds had a middle-income status. In addition, two-thirds of the patients defined their families as a nuclear family (Table 1).

The distribution of cancer types among the cancer group was as follows: lung cancer (n=14), breast cancer (n=22), head-neck cancer (n=40), and other types of cancer (n=24). All of the patients with the diagnosis of lung cancer were males, and all of the patients with the diagnosis of breast cancer were females (Table 2).

The mean score of the SR subscale, a personal adjustment subscale of the HPI, was found to be significantly lower in the cancer group compared to the control group (p=0.016). Similarly, the mean score of the ES subscale was found to be significantly lower in the cancer group compared to the control group (p=0.009). The results revealed no significant difference in the other two personal adaptation subscales, NT and PS. No significant difference was found between the groups regarding the social adaptation sub-scales, which were FA, SRe, SN, and AT (Table 3).

When the sub-scale scores of HPI were compared according to cancer types, the results revealed no significant difference between the groups in terms of their scores on the NT subscale. On the other hand, when the HPI subscales were investigated between control group and the different groups of cancer types, it was found that there were significant differences among groups in terms

Table 1. The Socio-demographic characteristics, n (%)

	Cancer	Control	p
Gender			
Female	50 (50.0)	47 (50.5)	0.940
Male	50 (50.0)	46 (49.5)	
Age			
<40	14 (14.0)	14 (15.1)	
40-49	27 (27.0)	31 (33.3)	0.529
50-59	31 (31.0)	30 (32.3)	
≥60	28 (28.0)	18 (19.4)	
Marital Status			
Married	87 (87.0)	81 (87.1)	
Single	5 (5.0)	6 (6.5)	0.845
Other	8 (8.0)	6 (6.5)	
Educational Level			
Primary	74 (74.0)	65 (69.9)	
Secondary	21 (21.0)	22 (23.7)	0.801
College	5 (5.0)	6 (6.5)	
Occupation			
Housewife	38 (38.0)	35 (37.6)	
Officer	1 (1.0)	5 (5.4)	
Employee	16 (16.0)	11 (11.8)	0.456
Retired	27 (27.0)	24 (25.8)	
Self-employed	18 (18.0)	18 (19.4)	
Place of Residence			
Village	11 (11.0)	13 (14.0)	
District	37 (37.0)	38 (40.9)	0.609
City	52 (52.0)	42 (45.2)	
Income			
Low	29 (29.0)	11 (11.8)	
Middle	67 (67.0)	72 (77.4)	**0.005**
High	4 (4.0)	10 (10.8)	
Family Type			
Nuclear	65 (65.0)	68 (73.1)	0.223
Extended	35 (35.0)	25 (26.9)	

Table 2. Distribution of the groups according to gender, n (%)

	Female	Male	Total
Lung Cancer	0 (0.0)	14 (100)	14 (100)
Breast Cancer	22 (100)	0 (0.0)	22 (100)
Head-neck Cancer	20 (50.0)	20 (50.0)	40 (100)
Other Types of Cancer*	8 (33.3)	16 (66.7)	24 (100)
Control Group	47 (50.5)	46 (49.4)	93 (100)
Total	97 (50.2)	96 (49.7)	193 (100)

*: Cancers related to gastrointestinal, skin, musculoskeletal and hematological systems

Table 3. Scores of the cancer and control groups regarding the sub-scales of HPI

HPI Sub-Scales	Cancer	Control	p
Personal Adaptation (PA)			
Self-realization	12.03±0.63	13.15±0.61	**0.016**
Emotional Stability	9.24±0.65	10.50±0.63	**0.009**
Neurotic Tendencies	10.10±0.77	10.48±0.76	0.506
Psychotic Symptoms	9.33±0.67	10.03±0.66	0.158
Total PA	40.62±2.26	43.99±2.21	**0.045**
Social Adaptation (SA)			
Family Affairs	13.31±0.75	13.18±0.74	0.811
Social Relations	11.60±0.68	12.48±0.67	0.081
Social Norms	14.16±0.45	14.48±0.44	0.334
Antisocial Tendencies	12.59±0.61	12.17±0.60	0.359
Total SA	51.61±1.78	52.20±1.74	0.655
General Adaptation (PA+SA)	92.22±3.72	96.30±3.65	0.140

HPI: Hacettepe Personality Inventory, Descriptive statistics given as mean±standart deviation

of SR, ES, and PS scores (respectively; p=0.004, p=0.001, and p=0.038). Further analysis of these results by the post hoc Tukey test showed that, the mean SR score of the group with head-neck cancer was significantly lower than the mean score of the control group (p=0.018). However, no significant difference was found between control group and the groups with lung cancer, breast cancer, and other types of cancer in terms of their mean SR scores. When the ES scores were compared, a significant difference was found between control group and the group with head-neck cancer using further statistical methods to test significance (p=0.015). No significant difference was found between control group and the groups with lung cancer, breast cancer, and other types of cancer again in terms of their mean ES scores. A significant difference was also found between the head-neck cancer group and control group in terms of PS scores by using further statistical methods. These statistics revealed that the mean PS score of the group with head-neck cancer was significantly lower than the mean PS score of control group (p=0.005). There was no significant difference between control group and the other cancer groups in terms of their mean PS scores. Lastly, comparing the scores of the groups with cancer and control group on the subscales FA, SRe, SN, and AT, the social adaptation subscales of the HPI, the mean scores of all groups were also found to be similar (Table 4).

DISCUSSION

The studies on the theory of a cancer-prone personality maintain its popularity in the literature due to the increasing incidence of cancer (7-16). While some studies asserted that there exists a set of personality traits that are prone to cancer exists, some revealed contradictory results (7-16,18-23). Epidemiological studies during the late 19th century and the early 20th century seemed to support a premorbid personality hypothesis (7-9). These studies have supported the previous clinical observations that cancer patients experience the loss of a meaningful love object, which can be more frequently explained compared to the situation of significant emotional stress (9-10). LeShan et al. (11), in their study on the mental aspects of cancer, conducted personality investigations with 455 cancer patients and also applied therapy in 71 end-stage cancer cases. He observed that 68 of the 71 patients receiving the therapy already had a mood of hopelessness prior to developing cancer. From this point of view, he concluded that cancer mostly occurred in patients who are prone to feelings of desperation, hopelessness, and depression. On the other hand, Hansen et al. (18) conducted o prospective study to investigate the relationship between personality and cancer by using the Eysenck Personality Inventory (EPI). They found no significant relationship between different dimensions of EPI and risk for any cancer type and researchers proposed that certain personality characteristics are not associated with any cancer risk. Considering the literature, in spite of the many studies investigating cancer and cancer disposition through the lens of personality traits, we did not come across a study using the HPI for cancer patients (7-16,18-26). So, the present study aimed to investigate and compare personality traits between the patients with different cancer types and the control group consisting of healthy individuals by examining personality characteristics with HPI as a different well-structured personality inventory. As far as we know, this study is the first study in terms of using the HPI for examining personality characteristics of cancer patients.

In the present study, the socio-demographic characteristics of the cancer group and control group were found to be similar, however, a difference regarding the income status was observed. The analysis regarding the socio-demographic data revealed that the income of the cancer patients was lower than controls. However, using the appropriate statistical method inactivated this difference, and its effect on further analyses was prevented. The gender distribution of the cancer group was different, even though the female/male ratio was equal in the entire group of participants. Similar to the incidence of cancer types according to gender, all those with lung cancer were males and all those with breast cancer were females (9,18).

According to the results of the present study, the scores of the group with head neck cancer on the SR and ES subscales that are used to measure personal adaptation in the HPI were lower than the scores of control group. The low scores on the SR and ES indicate that these individuals display the personality type that is characterized by introversion and tend to be unable to express their feelings, indecisive, insecure, and less self-sufficient. The difference

Table 4. Scores on the sub-scales of HPI according to cancer types

HPI Sub-Scales	Head-neck (n=40)	Lung (n=14)	Breast (n=22)	Other Types* (n=24)	Control (n=93)	p
Personal Adaptation (PA)						
Self-realization	11.28±0.55	12.00±0.70	12.73±0.67	12.54±0.56	13.57±0.31	**0.004**
Emotional Stability	8.03±0.50	10.36±0.82	8.68±0.74	10.33±0.68	10.70±0.37	**0.001**
Neurotic Tendencies	9.10±0.68	11.50±1.06	10.95±0.80	10.71±0.92	11.12±0.38	0.089
Psychotic Symptoms	8.90±0.55	11.36±0.67	10.36±0.66	10.17±0.70	10.78±0.36	**0.038**
Total PA	37.30±1.93	45.21±2.59	42.73±2.52	43.71±2.54	46.10±1.20	**0.004**
Social Adaptation (SA)						
Family Affairs	13.28±0.60	14.14±0.93	15.09±0.71	14.71±0.82	14.23±0.37	0.360
Social Relations	11.90±0.52	12.71±0.71	13.14±0.72	12.46±0.96	13.55±0.32	0.120
Social Norms	13.75±0.0	13.36±0.60	14.00±0.50	13.92±0.53	14.22±0.21	0.620
Antisocial Tendencies	11.80±0.50	12.79±0.73	13.55±0.64	13.58±0.61	12.61±0.29	0.099
Total SA	50.80±1.46	53.00±1.71	55.77±1.45	54.42±2.27	54.52±0.87	0.154
General Adaptation (PA+SA)	87.68±3.24	98.21±3.94	98.55±3.63	98.13±4.61	100.60±1.85	**0.011**

HPI: Hacettepe Personality Inventory, *: Cancers related to gastrointestinal, skin, musculoskeletal and hematological systems, Descriptive statistics given as mean±standart deviation

between the group with cancer and control groups in terms of the SR and ES scores supports the hypothesis that the individuals who are insufficient in terms of SR and ES are more prone to cancer. Some previous studies and evaluations also argued that cancer can be related to emotional inhibition and emotional trauma (11,19,20). Additionally, it was observed in many studies that the suppression of emotion as an entity involving the features of the ES subscale and the sense of anger as a consequence of this suppression can increase cancer risk (19,20). Shaffer et al. (21), in their studies on medical students with a 30-year follow-up, found that those who suppressed their feelings and were observed as "loners" were 16 times more likely to get cancer than those who were extroverts and stressed their feelings. Moreover, You et al. (16) proposed that personality traits have an effect on survives of breast cancer patients by the linkage with the relationship between coping strategies and personality traits. They claimed that personality traits and coping strategies have an effect on emotion adjustment of patients with breast cancer.

When the cancer group and control group were compared in terms of their scores on the NT subscale, both groups displayed characteristics such as expressing emotional conflicts in a physical way and the frequency of somatic symptoms. In other words, the results indicated that NT was not a significant factor in cancer development. On the other hand, Kissen and Eysenck (24) claimed that a high extroversion and low neuroticism score obtained using the EPI characterize individuals who are prone to lung cancer. Another prospective study with the larger sample size, by Schapiro et al. (27), did not found any relationship between extroversion and neuroticism as personality dimensions and the risk of cancer similar to our study. They claimed that differences in the results related to NT between studies could be associated with using different inventories in different types of cancer patients in these studies. This claim can be appropriate with the abovementioned and the present studies' results. Additionally, Kissen and Eysenck (24) examined only patients with lung cancer by using EPI. In the present study, we compared much more types of cancer patients but we used a different inventory than EPI. Both using different personality inventory and examining different types of cancer patients can cause differences in the findings related to the relationship between cancer and personality. It seems that in this field, there is a need to conduct much more study, which examines different types of cancer with similar personality inventories.

In the present study, there was also a significant difference between the head neck cancer group and control group in terms of PS. The characteristics of PS moving away from people, being alone, unable to focus attention, and continuous dreaming was observed especially in head neck cancer group. Regarding social adaptation subscales of HPI, the present study indicated no difference between the cancer group and control group in terms of their scores on the FA, SRe, and SN subscales. It can be said that some of the social adaptation subscales of the HPI (FA, SRe, and SN) are defined similarly to the extroversion dimension of the EPI. The present study's findings related to these dimensions consistent with previous studies (22-25). Schapiro et al. (27) in their study investigating the relationship between the development of hormone-based cancer types and personality traits reported that extroversion and neuroticism are not related with the risk of hormone-based cancers including the organs such as breast, uterus, prostate etc. Nakaya et al. (22) investigated the relationship between cancer and personality in the groups with the cancers of stomach, lung, colorectal, and breast using the EPI and found no difference in terms of personality traits in the groups with cancer types and in the entire group. In a prospective study conducted by Hansen et al. (18) also proposed that there is not a relationship between neuroticism or extraversion and the risk for any kind of cancer.

Since there is found a significant difference between cancer patients and control group in terms of the SR subscale a further analysis conducted among the subtypes of cancer patients. According to this analysis, it was found that these differences stem from the subgroup of the head-neck cancer type. Moreover, ES and PS scores only in the head-neck cancer group were found to be lower than other cancer types and the control group.

The low scores of SR in the HPI indicate that an individual is insecure, indecisive, and hesitant and has the feeling that he\she is not accepted in the society and is useless. The low SR scores of the group with head-neck cancer compared to other groups probably infer that these patients are more indecisive, unconfident, and withdrawn as well as these individuals are not accepted in the society and are in a feeling that they are useless.

Head-neck cancers have some unique problems among all other cancer types. Patients with head-neck cancer experience face deformity, xerostomia, subnutrition, aphonia, and communication difficulties more often than most of other cancer types (26). All these difficulties might explain the tendency of the people to be alone, their attempt to move away from people and to be alone, and their imagination in their inner world at an extreme level (their low scores on the SR sub-scale). In other words, the personality traits of the group with head-neck cancer that are different from the other groups might be the reactions emerged as a result of the head-neck cancer development rather than being a noteworthy factor in the cancer development. There are limited studies measured psychotic features in patients with cancer and none of them is conducted with the patients with head-neck cancer (12-21). Garcia-Torres et al. (12) compared the patients with breast cancer with controls based on their psychotic features. They found that patients with breast cancer have higher psychotic features than other those in the control group. They also observed that psychotic features predict depressive symptoms in the patients with breast cancer. It can be helpful to examine psychotic features and its relationships with other clinical issues in head neck cancer patients with larger sample sized and new studies.

Considering the results of the present study from a broader point of view independently of the cancer types, a difference was found between the group with cancer and control group regarding their scores on the SR and ES subscales. When the cancer types were considered, a difference was found in the group with head-neck cancer regarding the subscales PS as well as SR and ES. The fact that a significant difference regarding PS was found only in the group with head and neck cancer suggests that question that "is this difference an outcome of the cancer type?" Consequently, the personality characteristics of the group with head-neck cancer that is different from the

other groups seem to be the reactions emerged as a result of the head-neck cancer development rather than being a noteworthy factor in the cancer development. Future studies need to be done in the large clinical head neck cancer samples and with the different personality inventory to clarify this relationship.

In terms of limitations of the present study, having a relatively small sample size and the using only one personality inventory as data collection tool are the main limitations of this study. Assessing the personality characteristics of patients at the only one-time point is another limitation of this study. It would be helpful for future studies to examine personality characteristics at least one of the time points consist of premorbid assessments of participants.

CONCLUSION

The present study revealed that there are differences between cancer and control groups according to personality characteristics. The personality characteristics that are unique to the patients with head-neck cancers may be the reactions that appear as a result of the development of head-neck cancer rather than a significant factor in cancer development. Despite the limitations of the present study, the findings of this study are promising for further studies, which will compare the effects of different personality characteristics of different cancer patients with several personality inventories.

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