



# Type D Personality and Its Relationship with Perceived Stress Among Women with Breast Cancer Attending a Referral Center in Northern Iran in 2017

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## Abstract

**Background:** The impact of personality traits such as type D personality on the development of psychosomatic illnesses such as cancer has been found by many researchers in the field of health psychology.

**Objectives:** The purpose of this study was to investigate the status of the type D personality trait and its relationship with perceived stress among women with breast cancer.

**Methods:** This cross-sectional study enrolled 120 cancer patients during 2017. After applying the inclusion and exclusion criteria and obtaining informed consent, the patients were selected using the convenience sampling method and evaluated by the Type D Personality Scale (DS14) and Perceived Stress Scale (PSS).

**Results:** In this study, 69.2% of the patients obtained a score of  $\geq 29$  in the DS14 questionnaire. Correlation analysis between the components of DS14 and the final score of PSS showed that both social inhibition and negative affectivity had direct correlations with perceived stress ( $r = 0.35$  and  $r = 0.6$ , respectively;  $P < 0.001$ ).

**Conclusions:** One of the most important results of this study was a relatively high score of type D personality among patients with breast cancer and the high contribution of negative affectivity to the perceived stress by patients with this type of personality. The particular status of type D personality traits among cancer patients can be used to design psychotherapy programs for them to prevent disease progression.

**Keywords:** Breast Cancer, Negative Affectivity, Perceived Stress, Type D Personality

## 1. Background

Breast cancer is one of the most common cancers among women, with widely different prevalence in different parts of the world, probably due to the differences in the lifestyle, reproductive patterns, or genetic factors (1). A cancer diagnosis can entail many psychological and emotional challenges (2). The body and mind extensively interact with each other to maintain health. The evidence shows that chronic nervous stress may promote tumor growth and progress. The activation of the sympathetic nervous system suppresses the tumor-inhibiting genes, inhibits the immune system functioning, and promotes tumor growth (3). Perceived stress has been defined as the degree at which life situations are rated as stressful (4). Studies conducted on perceived stress suggest that stress and its effect on mental health are somewhat determined

by the individual's mental assessment of stressors or life events (5).

Following the proposed hypothesis of cancer-prone personality types in 1962, Kissen and Eysenck conducted the first study of the relationship between personality and cancer and reported that patients with lung cancer were more extraverted than a control group and less likely to be neurotic (6). Eysenck described the individual susceptibility to cancer, believing that people who have this attribute react with frustration and stress and also suppress their emotional reactions to life events (7). Some aspects of personality, such as depression, extroversion, and difficulty in excitement, are often associated with cancer. Some researchers describe individuals with such traits as type C or cancer-prone persons (8).

Evidence suggests that some personality styles or cop-

ing styles contribute to cancer progression and mortality. In a prospective study, Jensen suggested a relationship between suppressor personality and metastasis and mortality from breast cancer (9). People who have had cancer often report comorbidities, and of course, the risk of these diseases is different in different people. Type D, or distressed, personality is defined as the tendency toward negative affectivities and high social inhibition, and individuals with this type of personality are vulnerable to negative emotions such as depression or anxiety and consciously suppress self-disclosure in social interactions (10). Type D personality has been linked to several cardiovascular problems (11). Also, a study investigated the relationship of this type of personality and its components with behavioral health, emotional distress, and standard biomedical factors as the mechanisms of potential risks in diabetic adults (12).

## 2. Objectives

Considering the role and importance of psychosocial factors in physical health and the effect of personality traits on the development of psychosomatic diseases such as cancer, this study was designed to investigate the status of type D personality trait and its relationship with perceived stress among women with breast cancer.

## 3. Methods

A total of 120 patients with breast cancer referred to a referral center in the north of Iran during 2017 participated in this study. The minimum sample size was determined using the average frequency of type D personality in various cancer patients, which was 20% (13, 14). Thus, with a 95% confidence interval and a 7% error, the minimum sample size was determined as 120 patients.

The main inclusion criteria included patients undergoing medical treatment, being in a psychologically healthy state confirmed in psychiatric interviews, and experiencing a non-metastatic stage of the disease confirmed by experts based on clinical examinations and laboratory diagnoses. Patients undergoing surgical treatment, having a positive history of any psychiatric problem, or being in the metastatic stage of breast cancer were excluded from the study. The patients were selected by convenience sampling from those hospitalized in the Oncology Ward of Sari Imam Khomeini hospital as a tertiary referral center in the north of Iran during 2017. They were examined using the Type D Personality Scale (DS14) and the Perceived Stress Scale (PSS) after obtaining their informed consent. The present study received the Code of Ethics

(IR.Mazums.REC.96.4181) from Mazandaran University of Medical Sciences.

### 3.1. Type D Scale (DS14)

This scale was developed by Denollet in 2005. It contains 14 items in two seven-item subscales, including Negative Affectivity (NA) and Social Inhibition (SI). The items are rated on a five-point Likert scale including "Incorrect", "Somewhat incorrect", "No comment", "Somewhat correct", and "Correct", ranging from zero to four points (10). Cronbach's alpha coefficient was 0.86 for NA and 0.88 for SI subscales in the original version (15). In a study conducted by Hashemi and Peymania in Iran, internal consistency was found to be 0.77 for NA and 0.69 for SI subscales (16). Also, the construct validity of the Persian version of DS14 has been confirmed by Bagherian and Bahrami Ehsan (17). It is worth mentioning that the internal consistency of this scale in the current study was approved by Cronbach's alpha of 0.79. Although the original version of this scale uses a score of  $\geq 10$  for both NA and SI dimensions to classify as a trait of type D personality (10), we used a categorized method according to the Likert scale (Table 1) to interpret the total score of DS14 by integrating both NA and SI scores.

**Table 1.** Descriptive Statistics of Item Scores of Questionnaires

Variables	Mean (SD)	Median (IQR)	Frequency (%)
<b>Social inhibition</b>	16.4 (7.1)	18 (10)	
<b>Negative affectivity</b>	15.6 (4.5)	15 (6)	
<b>Type D personality score</b>	32.2 (10.1)	34 (12)	
14 or less			9 (7.5)
15 - 28			28 (23.3)
29 - 42			70 (58.3)
42 or more			13 (10.9)
<b>Negative perception</b>	16.6 (4.4)	17 (6)	
<b>Positive perception</b>	14.6 (5)	16 (7.5)	
<b>Perceived stress score</b>	31.3 (7.4)	31 (10)	

Abbreviations: IQR, interquartile range; SD, standard deviation

### 3.2. Perceived Stress Scale (PSS)

This 14-item scale was developed by Cohen et al. in 1983. Each item is rated on a five-point Likert scale, including nothing, low, moderate, high, and very high, ranging from zero to four points. Internal consistency reliability by Cronbach's alpha ranged from 0.84 to 0.86 in two groups of students and a group of smokers on a quitting program (18). In Iran, the content validity of this scale was confirmed

by 10 experts from Mashhad University of Medical Sciences. In a study conducted by Bastani et al., the reliability of the Persian version of this scale was confirmed by the internal consistency method with Cronbach's alpha of 0.74 (19). Also, the current study confirmed the internal consistency of the scale by Cronbach's alpha of 0.82. The minimum score on PSS is zero, and the maximum score is 56, with higher scores indicating more stress.

The study results are presented using descriptive (mean, standard deviation (SD), median, inter-quartile range (IQR), frequency, and percentage) and analyzed using the correlation analysis and multivariate linear regression model. Two-sided  $P < 0.05$  was taken as significant. The data were described and analyzed by IBM SPSS-24.

#### 4. Results

A total of 120 breast cancer patients with a mean (SD) age of 49.5 (10.2) years (24 - 79 years) took part in the study. First, all the study variables (social inhibition, negative affectivity, type D personality, negative perception, positive perception, and perceived stress) were assessed in terms of normal distribution using the Kolmogorov-Smirnov test, which showed that all the variables had a normal distribution, except for positive perception. Table 1 presents the descriptive statistics of variables in the questionnaires.

Interestingly, 58.3% of the patients scored between 29 and 42, and approximately 70% scored above 28 on DS14.

The correlation analysis between the components of DS14 and the final score of PSS showed that although perceived stress had a direct and significant correlation with both social inhibition and negative affectivity ( $P < 0.001$ ), the Pearson correlation coefficient was 0.35 for social inhibition and 0.6 for negative affectivity. In other words, the patients' negative affectivity had a greater effect than social inhibition on their perceived stress. This was also confirmed by Multiple Linear Regression (MLR) analysis, as shown in Table 2.

**Table 2.** Linear Regression Analysis of the Items of the Two Questionnaires<sup>a</sup>

Model	Standardized $\beta$ Coefficient	t	Statistical Significance
Constant	-	9.876	Less than 0.001
Negative affectivity	0.574	6.692	Less than 0.001
Social inhibition	0.055	0.647	0.519

<sup>a</sup>Dependent variable: perceived stress

To perform MLR, first, we checked the main assumptions such as multi-collinearity excluded by a variance inflation factor of less than 10 for all independent variables

and outliers, normality, linearity, homoscedasticity, and independence of residuals by inspecting the residuals scatter plot and normal probability plot of regression standardized residuals. Based on the MLR analysis, it can be seen that negative affectivity had a place in the regression equation with  $\beta = 0.57$ , which means that with each unit increase in negative affectivity, perceived stress increased by 0.57. However, social inhibition had no place in the regression equation with  $P = 0.519$ .

#### 5. Discussion

The most important results of this study are a fairly higher score of type D personality among breast cancer patients, and a highly incremental effect of negative affectivity as a dimension of personality on the prediction of perceived stress in type D personality cancer patients. Type D personality is relatively prevalent among healthy populations (20). In a study conducted in Germany, the frequency of this personality type was reported as 31% (21). Some researchers have recently investigated the frequency of type D personality in certain types of cancer. In two studies conducted by Mols et al., the prevalence of type D personality was found to be much higher than in previous studies (22). Such high prevalence could be associated with the high stage of cancer in these studies. In another study conducted to validate the French version of DS14 in the general population, patients with the acute coronary syndrome, and patients with breast cancer, in contrast to previous studies, the prevalence of type D personality was found to be higher in breast cancer patients than in those with the acute coronary syndrome (23).

Although no study has been conducted in Iran on the frequency of type D personality among cancer patients, its mean score (SD) was found to be 49.78 (18.58) in a study on cardiovascular patients (24), which is higher than that in the present study. One of the main issues associated with the relationship between personality and cancer is the tendency to suppress both positive and negative feelings, especially the suppression of anger, rage, and hostility toward oneself or others (25). Sandra et al. argued that a poor anger score in cancer patients is indicative of the suppression of anger and containment of rage, which showed that the absence of explicit expression of anger was at least one of the attributes of cancer patients (26). In the present study, the mean social inhibition score of 16.4 (compared to the expected mean value of 14) can somewhat confirm this fact. Previous studies have shown that the prevalence of stress, or psychological problems in general, is 25% to 30% in cancer patients (25). In a study conducted by Tarkhan, although the frequency of stress was not stated, the mean (SD) score of perceived stress was

28.21 (4.25) among women with breast cancer (27), which is slightly lower than that found in the present study [31.3 (7.4)].

Some studies have emphasized the relationship between stress and cancer, including a study by Irie et al., which showed that there may be a relationship between large workload and oxidative damage to DNA (the main cause of cancer) in people who take on heavy and stressful responsibilities and have higher levels of perceived stress (28). This was confirmed in the present study by the correlation between perceived stress and type D personality scores. A high level of perceived stress is evident in these patients, even after relief from cancer. In a study, Zhang showed that despite adjusting for underlying and confounding variables, type D personality patients experienced higher levels of stress and poorer quality of life than patients with other personality types, even three years after relief from gastric cancer (29). In a medical center in Taiwan, a group of researchers conducted a study to confirm the relationship of breast cancer with perceived stress and lifestyle. They showed that the combination of perceived stress and improper lifestyle behaviors could contribute to the progress of breast cancer (30). In agreement with the present study, Nakaya et al. also confirmed the role of negative affectivity in the exacerbation of perceived stress in cancer patients. In their study, a significant relationship was found between breast cancer and the absence of affective behaviors or distrust in one's feelings (31).

To confirm the correlation between personality type and cancer, most studies have used cross-sectional designs, and people with cancer and non-cancer have been examined at a snapshot in time; thus, it cannot be determined whether such traits lead to cancer or vice versa. Therefore, it is not surprising that people with cancer have a particular type of personality traits, such as a tendency to depression, suppression, or inhibition of their emotions about the disease. Other studies using longitudinal designs often show similar findings. For example, Shaffer et al. reviewed the attitudes of a group of healthy medical students about the family in 1987 and then tracked the participants to review their illnesses for 30 years over time. People with impaired self-awareness, without expressing excitement and a sense of selflessness and self-control, were 16 times more likely to develop cancer than others (8). To decrease the burden of this stigma that a specific personality trait can increase the susceptibility of individuals to cancer, it is mandatory to raise the awareness of the community, especially the close relatives of patients, that these people are not to blame for their illness and they do not pose a risk to others, as their main characteristic is self-repression, suppression, and lack of excitement during a discomfort.

Finally, it is necessary to note that the main limitation

of this study is its cross-sectional design, as it does not lead to a definite cause and effect relationship. Also, convenience sampling of patients as a method of non-random sampling should be declared as another limitation of this study.

### 5.1. Conclusion

The present study confirmed that the Type D personality scale with its two dimensions of social inhibition and negative affectivity has a high score among breast cancer patients. Additionally, this study showed a significant direct correlation between type D personality score and perceived stress score. According to these two findings, in addition to confirming the importance of psychotherapy in patients with breast cancer, we suggest designing cancer-prevention educational programs for the general population.

### Footnotes

**Authors' Contribution:** Siavash Moradi was statistical analyst and has edited final manuscript. Malihe Talebi Amrei was the case finder, the writer of the first draft of the manuscript and has observed the questionnaire filling. Ghasem Janbabai was the case provider and the medical therapist. Fateme Zamani has observed the questionnaire filling.

**Conflict of Interests:** There is no conflict of interest among the authors.

**Ethical Approval:** IR.Mazums.REC.96.4181.

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**Informed Consent:** Informed consent was obtained from the participants.

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