Personality Traits and Fear of Cancer Recurrence Among Breast Cancer Survivors

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Abstract

Background: Fear of cancer recurrence is fear or worry about the possibility of cancer returning or progressing. Patients with breast cancer often experience varied psychosocial responses and potentially influenced by personality traits. Understanding these traits can help clinicians predict psychological reactions and tailor early psychiatric interventions **Aim of study:** This study aimed to assess the relation between personality traits and fear of cancer recurrence among breast cancer survivors. **Subjects and Method: Research design**: A descriptive cross- sectional study design was utilized in this study. **Setting:** This study was conducted at radiation and chemical oncology outpatient clinic at Zagazig University Hospitals, Sharkia Governorate, Egypt. **Subjects: Sample**: A purposive sample of 175 women was used in this study. **Tools of data collection:** Demographic and clinical data questionnaire, fear of cancer recurrence inventory-shorter form, and Big five personality Inventory **Results:** The study result showed that, more than half of studied survivors had a high level of FCR, and moderate intensity extraversion personality traits. Furthermore, there was highly statistically significant negative correlation between total fear of cancer recurrence and extraversion, agreeableness, conscientiousness, and openness. While, it has positive correlation with neuroticism. **Conclusion:** extraversion personality traits was statistically significant negative predictor for fear of cancer recurrence while, agreeableness and neuroticism were statistically significant positive predictor of it. **Recommendations:** This study recommended that counseling based on transpersonal psychotherapy can reduce the fear of recurrence and stress in breast cancer survivors.

Keywords: *Breast Cancer Survivors, Fear of Cancer Recurrence, Personality Traits.*

Introduction

Breast cancer is a malignancy characterized by the abnormal transformation and uncontrolled proliferation of cells constituting breast tissue. It ranks among the most prevalent cancer types globally. Breast cancer is prevalent among women**.** Breast cancer is categorized into three main types: noninvasive (in situ), invasive and metastatic breast cancers. Invasive breast cancer has the potential to metastasize, whereas noninvasive cancer does not exhibit spreading characteristics. Within the noninvasive category, there are two subtypes: ductal carcinoma in situ and lobular carcinoma in situ **(Abdioglu et al., 2023).**

The National Cancer Institute (NCI) defined an individual as a cancer survivor from the time of diagnosis until the end of life. This period involves how the initial diagnosis of cancer affects the physical, mental, emotional, social, and financial aspects of a person, and continues through treatment and beyond. Many survivors are known to deal with the side-effects of treatments, namely instant pain, fatigue and insomnia. Furthermore, breast cancer survivors face obstacles to resume normal life, such as fear of recurrence, disturbance of body image and sexual dysfunction after a mastectomy.

It is essential to acknowledge the physical, psychological and social difficulties that women face after receiving the treatments **(Li, Wong, and Low 2024).**

Personality is the process of individual socialization, the process of regularly adjusting one's behavior, the process of self-assessment, and self awareness by individual to align with social standards and requirements. On the other hand, personality is the process of social individualization, manifested through the individual's imprint, their role as a subject with unique individual, freedom and characteristics of each person. Personality is considered a standard to evaluate achievements as well as shortcomings in the general cultural development of individuals **(Trang, 2024).**

Five-factor model of personality (FFM) is a set of five broad trait dimensions or domains, often referred to as the "Big Five": Extraversion, Agreeableness, Conscientiousness, Neuroticism, and Openness to Experience (sometimes named Intellect). Highly extraverted individuals are assertive and sociable, rather than quiet and reserved. Agreeable individuals are cooperative and polite, rather than antagonistic and rude. Conscientious individuals are task-focused and orderly, rather than distractible and disorganized **(Soto and Jackson, 2020).**

Furthermore, fear of cancer recurrence (FCR) is the term for the psychological state in which cancer survivors are concerned and afraid of cancer recurrence, progression, or metastasis at the primary site. It is the most common social and psychological problem reported by breast cancer survivors and their partners **(Tong et al., 2024).** FCR not only generates negative emotions in patients but can also lead to ineffective interpersonal relationships, family breakdown, and an inability to fulfill normal family responsibilities, causing serious negative impacts on both the patient and their spouse **(Zhang et al., 2022).**

The development and progression of breast cancer are significantly influenced by personality traits. It have been suggested that there may be a correlation between personality and cancer incidence, findings on the connections between personality and health outcomes in cancer patients have been mixed. Personality, which encompasses how individuals perceive, behave, and emotionally react, plays a crucial role in shaping the course and outcomes of cancer**.** It have been explored how personality traits influence the prognosis and quality of life of cancer patients, particularly breast cancer survivor **(Muntaha, Khan, and Iqbal 2024).**

Personality traits, particularly extraversion and neuroticism, have been consistently found to predict well-being and emotional outcomes in cancer patients. Severe life events and depression were the strongest predictors of breast cancer, and depression was inextricably linked with neuroticism. It have been found that neurotic personality could predict quality of life and emotional functioning. It have demonstrated that higher levels of neuroticism predict lower quality of life and higher stress **(Yeh and Li, 2025).**

Nurses play a pivotal role in breast cancer care by addressing the psychosocial needs of patients through compassionate and evidence-based interventions. By employing therapeutic communication techniques, they build trusting relationships that empower patients to openly share their experiences, concerns, and personal preferences creating a supportive environment for holistic healing **(Arkorful et al., 2021).** Furthermore, Nurses establish a supportive atmosphere by actively listening, showing empathy, and validating patients' emotions, thereby ensuring that patients feel heard, comprehended, and esteemed. In addition, nurses offer instruction and knowledge regarding cancer diagnosis, treatment alternatives, and resources for supportive care. This enables patients and their families to make well-informed choices about their healthcare. Their purpose is to correct misunderstandings, explain uncertainties, and offer advice on how to manage symptoms, implement self-care techniques, and access support resources **(Benson et al., 2020).**

Significance of the study:

Breast cancer (BC) is the most commonly diagnosed cancer worldwide, with estimated new cases exceeding 2 million in 2020 **(Sung et al., 2021)**. It is the most common cancer detected among women, accounting for approximately one in three cancers. According to findings from the Egyptian National Cancer Institute, breast cancer represents 18.9% of total cancer cases among women **(Darwish et al., 2017)**.

Personality characteristics have long been recognized as significant predictors of psychological adjustment in individuals with cancer. It have been shown that traits such as extraversion, neuroticism, and conscientiousness are strongly associated with emotional outcomes and overall life satisfaction. Specifically, neuroticism accounts for approximately 29% in negative affect, while extraversion explains 19% in positive affect. Moreover, the combined influence of all five major personality traits contributes to 39% in overall quality of life. Among these, conscientiousness has been well documented to be the best protective factor for physical health such as longevity, illness burden and even disease progression **(Udeze et al., 2023).** Therefore, the present study aims to assess the relations between personality traits and fear of cancer recurrence among breast cancer survivors.

Aim of the study:

The aim of the present study was to assess the relation between personality traits and fear of cancer recurrence among breast cancer survivors.

Research questions:

- What is the level of fear of cancer recurrence among breast cancer survivors ?
- What are the types of personality traits used by breast cancer survivors?
- Is there a relation between personality traits and FCR among breast cancer survivors?

Subjects and methods:

Study design:

A descriptive cross- sectional study design was utilized in the current study.

Study setting:

This study was conducted at radiation and chemical oncology outpatient clinic at Zagazig University Hospitals, the Sharkia Governorate of Egypt

Study subjects:

A purposive sample of 175 women with breast cancer from the above-mentioned setting.

Inclusion criteria:

Female patients aged between 20 and 50 years, at least three months post-completion of all treatments following diagnosis, including surgery, chemotherapy, and radiotherapy, diagnosed with non-metastatic breast cancer, willing and able to provide informed consent to participate in the study.

Exclusion criteria:

A diagnosed personality disorder, a history of chronic psychiatric conditions.

Sample size:

The sample size was calculated by the following equation: The size effects of conscientiousness as one dimension of personality traits employ a role in decrease fear of cancer recurrence in breast cancer survivors, was $\beta = -0.098$,(**Hosseini, et al 2023**), power of test 80%,and confidence level 95%, the sample size calculated to be 175 women.

Tools for data collection:

Tool I: Demographic and clinical data questionnaire :

It was developed by the researcher to collect comprehensive information on participants' socio-demographic and clinical characteristics of patients as age, marital status, residence, educational level, income, occupation, and clinical data include family history of breast cancer, disease duration, and treatment methods.

Tool II: Fear of Cancer Recurrence Inventory-Shorter Form (FCR-SF):

The FCR was assessed using short form FCRI-SF, which was developed by (**Simard and Savard, 2015**). This tool is a concise, 9-item self-report questionnaire designed to evaluate the psychological impact of cancer recurrence fears.

Scoring system *:*

The FCRI-SF is scored using a 5-point Likert scale, where each item is rated from: 0 (not at all) to 4 (a great deal) (0 = Not at all, *1*= A little, 2 = Somewhat, 3 =A lot, 4 = A great deal)**.** The total score ranged from 0 to 36, the scale consists of 9 items. Scores are obtained by summing responses across all items. A total score ranged from 0-12 indicated low fear of cancer recurrence, 13-21 represented an elevated FCR,

whereas a score of 22 or higher indicated severe FCR and may require further intervention.

Tool III: Big Five personality Inventory :

This self-report measure is designed to assess key dimensions of personality. It was developed by **(John and Srivastava, 1999),** the scale comprises 44 items that yield scores across five distinct personality traits. Each trait is represented by a dedicated subscale: This scale provides a score for each of the five personality traits. It consists of five subscales, including : conscientiousness (9 items), agreeableness (9 items) neuroticism (8 items) extroversion (8 items) and openness (10 items).

Scoring system *:*

Participants respond to each item using a five-point Likert scale, indicating the extent to which they agree or disagree with each statement. The scale ranges from 1 (Strongly Disagree) to 5 (Strongly Agree), with the following response options: Strongly disagree = 1, disagree a little = 2, Neither agree nor disagree = 3, Agree a little = 4, Strongly agree = 5. Several items on the scale are reverse-coded to control for response bias. Specifically, items (No 2, 6, 8, 9, 11, 13, 15, 20, 21, 22, 26, 28, 31, 33, 40, and 42) are negatively worded and require score reversal during data entry to ensure accurate interpretation. Extroversion (8 items): total score (8-40), agreeableness (9 items): total score (9-45),conscientiousness (9 items): total score (9-45) , neuroticism (8 items): total score (8-40), openness (10 items): total score (10-50)**.**

Content validity and reliability:

The tools were reviewed by a panel of three experts from the department of psychiatric and mental health nursing at the faculty of nursing, Zagazig University. The experts evaluated the tools for clarity, relevance, comprehensiveness, and understandability. Based on their assessment, no modification were required. All scales were translated into Arabic using the translate–back–translate method, thereby preserving the original validity of the instruments. Reliability was assessed using Cronbach's alpha coefficient, which demonstrated a high level of internal consistency. Big five personality traits scale scored include the followings: Extraversion of scale yielded a Cronbach's α of (0.719)**,** Agreeableness (0.707), Conscientiousness (0.700), Neuroticism (0.723), Openness (0.732). while the fear of cancer recurrence scale scored (0.863)**,** indicating strong reliability for both measures.

Field work:

Following ethical approval and permission to proceed with the study, the researcher approached female patients diagnosed with breast cancer at the hematology clinic, internal medicine tumor clinic, oncology clinic, and nuclear medicine clinic who met the inclusion criteria. The researcher introduced herself and clearly explained the study's purpose in order to obtain informed consent from each participant. All patient inquiries were addressed thoroughly, and detailed instructions were given to ensure participants' understanding, acceptance, and cooperation during the interview sessions. Based on the pilot study findings, the average time required to complete all data collection sheets ranged from 40 to 45 minutes. Data collection was conducted in the outpatient clinics three days per week (Sunday, Monday, and Wednesday) from 9:00 AM to 1:00 PM. The data collection phase spanned four months, from the beginning of August 2024 to the end of November 2024.

Pilot study:

A pilot study was conducted involving approximately 18 breast cancer survivor patients, representing around 10% of the total sample size. The primary aim was to assess the feasibility and clarity of the data collection tools, as well as to estimate the time required for completion. Since no modifications were necessary following the pilot phase, the pilot sample was subsequently incorporated into the main study sample.

Administration and Ethical consideration:

The study proposal received ethical clearance from the postgraduate and research ethics committee (REC) at the Faculty of Nursing, Zagazig University, under approval code M.DZU.NUR/219/10/6/2024. Prior to initiating the study, formal authorization was obtained through an official letter issued by the dean of the Faculty of Nursing to both the director of the Outpatient Clinic and the dean of the Faculty of Medicine at

Zagazig University. Subsequently, the hospital director and nursing director granted permission to proceed with the research.

Breast cancer survivor patients were fully informed about the study's objectives and assured that their participation was entirely voluntary. They were also notified of their right to withdraw from the study at any time without the need to provide justification. To maintain confidentiality and protect participant identity, all collected data were anonymized and coded.

Statistical analysis:

Data analysis was conducted using Microsoft excel and the statistical package for social sciences SPSS, version 25. Descriptive statistics were employed to summarize the data: categorical variables were presented as frequencies and percentages, while quantitative variables were expressed as arithmetic means ($\bar{X}$) and standard deviations (SD). Inferential statistics included the chi-square test and associated p-values to examine associations between categorical variables. The Pearson correlation coefficient (r) was used to assess the strength and direction of relationships between continuous variables. A linear regression model was applied to explore the predictive relationship between cognitive emotional regulation, and fear of cancer recurrence among breast cancer survivors.

The reliability of the study tools was evaluated using Cronbach's alpha coefficient. Statistical significance was interpreted as follows: P-values ≥ 0.05 were regarded as statistically non-significant, p-values < 0.05 as statistically significant, and p-values < 0.01 as very highly statistically significant.

Results:

Figure 1 shows that, 54.3% of the studied breast cancer survivors had high level of fear of cancer recurrence, and 34.3% of them had moderate level. While, 11.4% of them had low level fear of cancer recurrence

Figure 2 shows that, 65.7 % of studied sample had high intensity of conscientiousness personality traits and 59.4 % of them had high intensity of agreeableness personality traits. On the other hand, 66.3 %, 58.9%, and 53.2% of them had moderate intensity of extraversion, neuroticism, and openness personality traits respectively. The highest mean score of conscientiousness is (***34***.86±5.57) while, the lowest mean score of extraversion is (***23***.89±5.13).

Table 1 reveals a highly statistically significant relationship between fear of cancer recurrence and both income and occupation among the studiedsample**.** Additionally, a statistically significant association was observed between fear of cancer recurrence and age. Notably, the highest levels of fear were reported among individuals aged 20 to <30 years, those with have insufficient income, and those who were unemployed.

Table 2 points that, there was highly statistically significant relation between total extraversion and agreeableness of personality traits of the studied sample and age, income and occupation. There was also statistically significant relation between total extraversion of personality traits of the studied sample and their disease duration at. The level of extraversion and agreeableness were high among those whose age ranged from 40-50 years old, have sufficient and saving income, who are employed. The level of extraversion was high among patients who have disease duration less than one years.

Table 3 reveals that, there was highly statistically significant negative correlation between total fear of cancer recurrence and extraversion, agreeableness, conscientiousness, and openness. While, it has positive correlation with neuroticism.

Regarding Table 4 personality traits extraversion was statistically significant negative predictor for fear of cancer recurrence While, agreeableness and neuroticism were statistically significant positive predictor for fear of cancer recurrence.

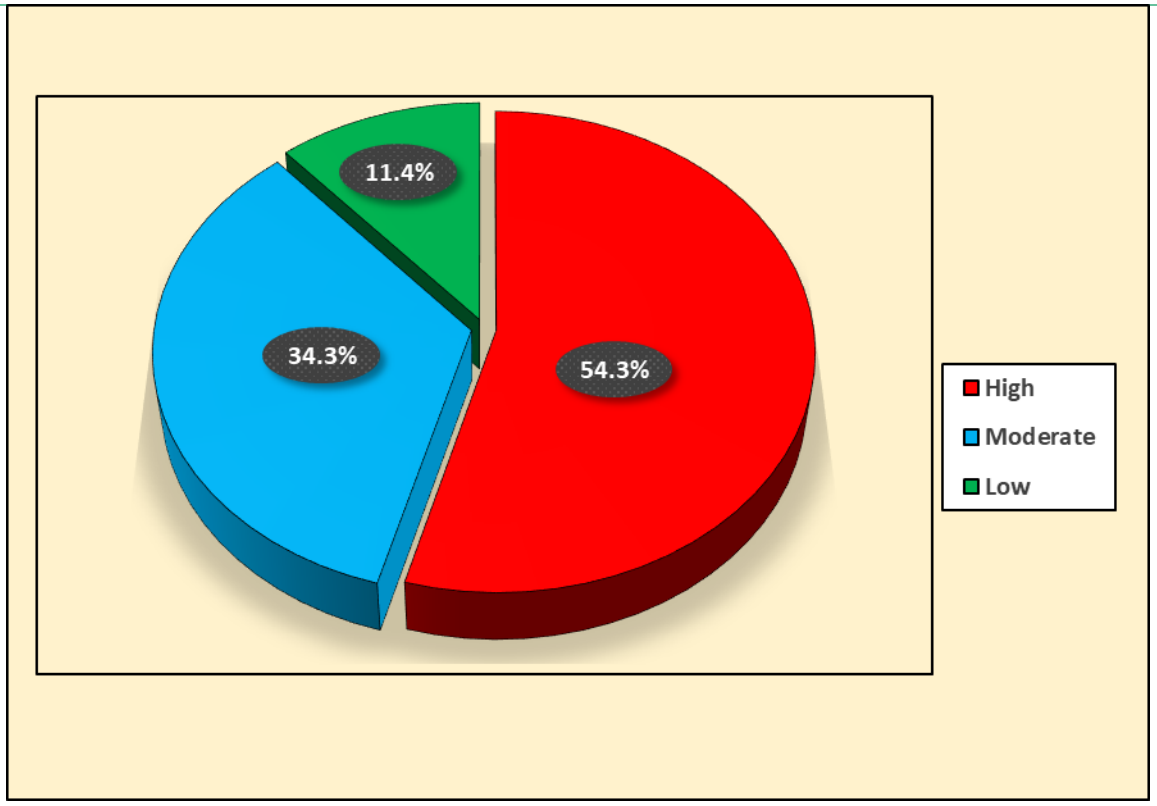

Figure (1): Percentage distribution of the studied breast cancer survivors according to their levels of fear of cancer recurrence **(n=175).**

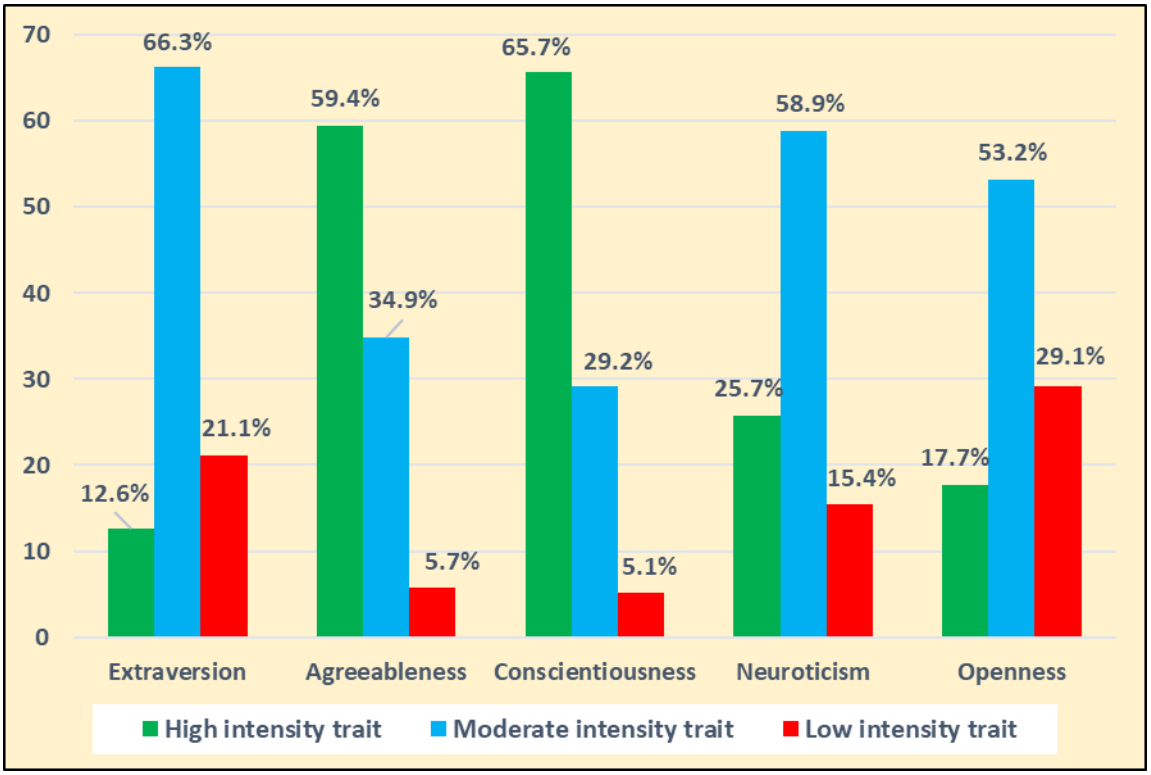

Figure (2): Percentage distribution of the studied breast cancer survivors according to types of personality traits **(n=175).**

Table (1): Relation between demographic and clinical characteristics of the studied breast cancer survivors and total fear of cancer recurrence **(n=175).**

socio-demographic data		No.	Levels of fear of cancer recurrence						X^2	P-Value
			High (n=95)		Moderate (n=60)		Low (n=20)			
			No.	%	No.	%	No.	%		
Age	20-<30	**14**	12	85.7	1	7.1	1	7.1	11.08	0.026*
	30-<40	**39**	24	61.5	14	35.9	1	2.6		
	40-50	**122**	59	48.4	45	36.9	18	14.8		
Marital status	Single	**3**	1	33.3	2	66.7	0	0.0	4.336	0.631
	Married	**161**	87	54.0	56	34.8	18	11.2		
	Widowed	**6**	3	50.0	2	33.3	1	16.7		
	Divorced	**5**	4	80.0	0	0.0	1	20.0		
Residence	Rural	**124**	73	58.9	40	32.3	11	8.9	4.593	0.101
	Urban	**51**	22	43.1	20	39.2	9	17.6		
Educational level	Illiterate	**13**	8	61.5	5	38.5	0	0.0	12.47	0.131
	Read and write	**18**	13	72.2	4	22.2	1	5.6		
	Primary education	**36**	25	69.4	7	19.4	4	11.1		
	Secondary education	**75**	36	48.0	30	40.0	9	12.0		
	University education	**33**	13	39.4	14	42.4	6	18.2		
Income	Sufficient	**60**	34	56.7	19	31.7	7	11.7	17.36	0.002**
	Insufficient	**104**	60	57.7	36	34.6	8	7.7		
	Sufficient and saving	**11**	1	9.1	5	45.5	5	45.5		
Occupation	Employed	**23**	3	13.0	10	43.5	10	43.5	32.75	0.000**
	Unemployed	**152**	92	60.5	50	32.9	10	6.6		
Family history from breast cancer	Yes	**47**	28	59.6	16	34.0	3	6.4	1.764	0.414
	No	**128**	67	52.3	44	34.4	17	13.3		
Disease duration	≤ 1 Year	**56**	28	50.0	18	32.1	10	17.9	3.364	0.186
	> 1 Year	**119**	67	56.3	42	35.3	10	8.4		

X^2= Chi-square test. No statistically significant at p > 0.05. * Statistically significant at p ‹ 0.05. ** Highly statistically significant at p ‹ 0.01.

Table (2): Relation between demographic and clinical characteristics of the studied breast cancer survivors and levels of extraversion and agreeableness dimensions of personality traits **(n=175).**

socio-demographic data		No.	Types of personality traits											
			Levels of Extraversion						Levels of Agreeableness					
			High (n=22)		Moderate (n=116)		Low (n=37)		High (n=104)		Moderate (n=61)		Low (n=10)	
			No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Age (Years)	20-<30	**14**	1	7.1	5	35.7	8	57.1	2	14.3	9	64.3	3	21.4
	30-<40	**39**	3	7.7	25	64.1	11	28.2	21	53.8	18	46.2	0	0.0
	40-50	**122**	18	14.8	86	70.5	18	14.8	81	66.4	34	27.9	7	5.7
Test of Sig.			**X^2=15.71 p=0.003****						**X^2=20.89 p=0.000****					
Marital status	Single	**3**	0	0.0	3	100.0	0	0.0	3	100.0	0	0.0	0	0.0
	Married	**161**	21	13.0	105	65.2	35	21.7	92	57.1	59	36.6	10	6.2
	Widowed	**6**	0	0.0	5	83.3	1	16.7	5	83.3	1	16.7	0	0.0
	Divorced	**5**	1	20.0	3	60.0	1	20.0	4	80.0	1	20.0	0	0.0
Test of Sig.			**X^2=2.936 p=0.817**						**X^2=4.855 p=0.563**					
Residence	Rural	**124**	11	8.9	85	68.5	28	22.6	75	60.5	41	33.1	8	6.5
	Urban	**51**	11	21.6	31	60.8	9	17.6	29	56.9	20	39.2	2	3.9
Test of Sig.			**X^2=5.379 p=0.068**						**X^2=0.877 p=0.645**					
Education level	Illiterate	**13**	0	0.0	10	76.9	3	23.1	10	76.9	3	23.1	0	0.0
	Read and write	**18**	1	5.6	14	77.8	3	16.7	14	77.8	4	22.2	0	0.0
	Primary education	**36**	4	11.1	22	61.1	10	27.8	18	50.0	16	44.4	2	5.6
	Secondary education	**75**	9	12.0	50	66.7	16	21.3	45	60.0	24	32.0	6	8.0
	University education	**33**	8	24.2	20	60.6	5	15.2	17	51.5	14	42.4	2	6.1
Test of Sig.			**X^2=8.388 p=0.397**						**X^2=8.054 p=0.428**					
Income	Sufficient	**60**	9	15.0	33	55.0	18	30.0	30	50.0	24	40.0	6	10.0
	Insufficient	**104**	8	7.7	78	75.0	18	17.3	64	61.5	36	34.6	4	3.8
	Sufficient and saving	**11**	5	45.5	5	45.5	1	9.1	10	90.9	1	9.1	0	0.0
Test of Sig.			**X^2=18.48 p=0.001****						**X^2=15.55 p=0.007****					
Occupation	Employed	**23**	11	47.8	10	43.5	2	8.7	21	91.3	0	0.0	2	8.7
	Unemployed	**152**	11	7.2	106	69.7	35	23.0	83	54.6	61	40.1	8	5.3
Test of Sig.			**X^2=30.19 p=0.000****						**X^2=14.17 p=0.001****					
Family history from breast cancer	Yes	**47**	2	4.3	31	66.0	14	29.8	27	57.4	18	38.3	2	4.3
	No	**128**	20	15.6	85	66.4	23	18.0	77	60.2	43	33.6	8	6.3
Test of Sig.			**X^2=5.807 p=0.055**						**X^2=0.500 p=0.779**					
Disease duration	≤ 1 Year	**56**	14	25.0	31	55.4	11	19.6	30	53.6	22	39.3	4	7.1
	> 1 Year	**119**	8	6.7	85	71.4	26	21.8	74	62.2	39	32.8	6	5.0
Test of Sig.			**X^2=11.69 p=0.039***						**X^2=1.233 p=0.540**					

X^2= Chi-square test. No statistically significant at p > 0.05. * Statistically significant at p ‹ 0.05. ** Highly statistically significant at p ‹ 0.01.

Table (3): Correlation matrix between total fear of cancer recurrence, types of personality traits among breast cancer survivors **(n=175).**

Variables		Fear of cancer recurrence	Extraversion	Agreeableness	Conscientiousness	Neuroticism
Extraversion	**r**	-0.608-				
	P	**0.000****				
Agreeableness	r	-0.451-	0.563			
	P	**0.000****	**0.000****			
Conscientiousness	**r**	-0.415-	0.453	0.705		
	P	**0.000****	**0.000****	**0.000****		
Neuroticism	**r**	0.574	-0.720-	-0.590-	-0.546-	
	P	**0.000****	**0.000****	**0.000****	**0.000****	
Openness	**r**	-0.547-	0.731	0.565	0.551	-0.740-
	P	**0.000****	**0.000****	0.000**	**0.000****	**0.000****

r= Spearman correlation coefficient test. **(-)** = Negative correlation. **Highly statistically significant at p ‹ 0.01.

Table (4): Multiple linear regression analysis of the effect of fear of cancer recurrence and types of personality traits among breast cancer survivors **(n=175).**

Variables	B	Std. Error	Beta	t	P. value	R^2	ANOVA	
							F	P. value
Model 1						0.252	58.16	.000**
(Constant)	3.059	0.153		20.004	**0.000****			
Fear of cancer recurrence	-0.462-	0.061	-0.502-	-7.627-	**0.000****			
Model 2						0.632	57.97	.000**
(Constant)	69.006	14.992		4.603	**0.000****			
Extraversion	1.074	0.283	0.313	3.795	**0.000****			
Agreeableness	-0.225-	0.171	-0.083-	-1.317-	0.189			
Conscientiousness	1.290	0.267	0.415	4.837	**0.000****			
Neuroticism	-0.799-	0.255	-0.272-	-3.134-	**0.002****			
Openness	-0.175-	0.164	-0.080-	-1.065-	0.288			

B=Unstandardized Coefficients. **Beta**=Standardized Coefficients. **t:** Independent t-test. **R^2** = Coefficient of multiple.
**Highly significant at p ‹ 0.01.

Discussion:

Regarding the level of fear of cancer recurrence (FCR) among, the current findings revealed that more than half of the breast cancer survivors experienced a high level of fear. This answer the first research question. This results may because factors, including uncertainty about disease, anxiety and depression, and inadequate social support. Additionally, physical symptoms particularly fatigue and the experience cancer treatment side effects. This results was supported by a study conducted in Korea by **Ding et al., (2024)** who detected that about more than half of patients experienced high level of (FCR)**.** Similar to this finding a study conducted in Norwegian by **Vandraas et al., (2023)** estimated that majority of patients had high level of FCR. This results was contradicted with a study conducted by **Schapira et al., (2022)** in the United States and Canada revealed that the majority of participants had moderate level of FCR**.** Also, a study conducted by **Haddaoui et al., (2025)** in Tunisia found that the majority of breast cancer survivors had low level of FCR.

The results of the current study revealed that there were highly statistically significant relations between FCR of the studied sample and their income and occupation. Additionally, a statistically significant association was found between FCR and age. Notably, higher levels of FCR were observed among breast

cancer survivors (BCS) aged 20 to under 30 years old, those with insufficient income, and those who were unemployed. This suggests that younger survivors tend to experience greater fear of recurrence compared to their older survivors. Such heightened fear may stem from a combination of factors, including greater life disruption, increased anxiety, and a longer anticipated lifespan during which recurrence could occur. Moreover, younger women often face distinct challenges such as career development, family planning, financial instability, and maintaining a social life that are particularly vulnerable to the impact of cancer and its treatment.

In the same context, the systematic review of **Anderson et al., (2021)** displayed that there was significant relation between FCR and younger age, lower income, unemployed, female gender. Also, **Richter et al., (2022)** in Germany demonstrated that age was significantly related with FCR levels, indicating that younger individuals tend to experience higher levels of FCR. In the same vein, the study conducted by **Buyukokudan and Korukcu, (2024)** in Turkey showed that there was a significant relationship between FCR and age, occupational status and monthly income. These results was align with a study by **Zhu et al., (2024)** in China which proved that individuals who are unemployed or have lower occupational status tend to report higher levels of FCR.

According to type of personality traits among studied Patients, the present study illustrated that about two thirds of breast cancer survivors had moderate intensity extraversion of personality traits. The third research question was answered by this results. This may be because a combination of factors including the development of stronger social support networks, a shift in priorities, and the adoption of more adaptive coping mechanisms. These factors can lead to greater social engagement, optimism, and a sense of control, which are often associated with higher extraversion scores.

This finding was harmony with a study conducted by **Hanney et al., (2021)** indicated that, breast cancer survivors tend to have a moderate level of extraversion of personality traits. In the same line, descriptive systematic review of **Wintraecken et al., (2022)** in European about the relationship between personality traits and quality of life of breast cancer women who mentioned that breast cancer women had moderate level of extraversion personality trait.

According to the relation between personality traits and sociodemographic and clinical data among studied Patients, the present study result showed that there was highly statistically significant relation between total extraversion and agreeableness of personality traits of the studied sample and their age, income and occupation. There was also statistically significant relation between total extraversion of personality traits of the studied sample and their disease duration. This might be due to the influence of these personality traits on social connections, coping mechanisms, and overall well-being, which are in turn influenced by age, socioeconomic status, and career paths. Extraversion characterized by sociability and outgoingness, can lead to stronger social support networks. Agreeableness which involves traits like kindness and empathy, can influence how individuals cope with stress and adversity so that these personality traits are known to influence social interactions, coping mechanisms, and overall well-being.

Similar finding was found by the study of **Hajek, (2024)** in Germany who estimated that there are significant associations between personality traits, such as agreeableness and extraversion, and their age, income and occupation among breast cancer survivors. Also, these finding approved by **Al-Karni et al., (2024)** in Saudi Arabia who reported that there was relation between total extraversion of personality traits of breast cancer patients and their disease duration.

Furthermore**,** the present study displayed that there was highly statistically significant relation between total conscientiousness and neuroticism of personality traits of the studied sample and their age, income and occupation. This means that, the level of conscientiousness was high among those whose age ranges between 40-50 years old, have sufficient and saving income and those who are employed. But, level of neuroticism was high among those whose age ranges between 20-<30 years old, have sufficient income and those who are unemployed. This might be due to conscientiousness, a personality trait associated with being organized and diligent, might increase with age as individuals develop greater self-discipline and responsibility. Income and occupation, often linked to career progression and financial stability, could also influence conscientiousness, with higher-paying and more demanding jobs potentially requiring and fostering more

conscientious behavior. Conversely, neuroticism, characterized by emotional instability, might be negatively correlated with income and certain occupations, as individuals high in neuroticism might experience greater stress and difficulty in high-pressure environments.

The result was approved by **García-Torres and Castillo-Mayén, (2019)** in Spain who indicated that there was a highly statistically significant relation between total conscientiousness and neuroticism of personality traits and their age, income, and occupation among breast cancer survivors. This suggests that these personality traits may play a significant role in determining various aspects of life, including age, income, and occupation, in breast cancer survivors.

Regarding to the correlation between fear of cancer recurrence, types of personality traits of breast cancer survivors, the current study result showed that there was highly statistically significant negative correlation between total fear of cancer recurrence, extraversion, agreeableness, conscientiousness, and openness. While, it has positive correlation with neuroticism. This can be explained by how these personality traits and coping mechanisms influence an individual's experience and management of stress and negative emotions. Individuals with higher levels of extraversion, agreeableness, conscientiousness, and openness tend to be more resilient, have better emotional regulation, and are more likely to seek social support, all of which can buffer against the distress associated with FCR. In accordance with these findings, a study conducted by **Bentley et al., (2023)** in Europe indicated that FCR was negatively correlated with extraversion, agreeableness, conscientiousness, and openness among breast cancer survivors. While, it has positive correlation with neuroticism.

As supported by best fitting multiple linear regression model for FCR, extraversion of personality traits was statistically significant negative predictor for fear of cancer recurrence While, agreeableness and neuroticism were statistically significant positive predictor for fear of cancer recurrence. As in breast cancer survivors, higher levels of extraversion were found to be associated with lower fear of cancer recurrence, while higher levels of agreeableness and neuroticism were associated with greater fear of recurrence. This means that individuals with high extraversion may experience less anxiety about their cancer returning. Conversely, those who are more agreeable and neurotic may experience greater fear. In the same vein the study conducted by **Hajek, Kretzler, and Koenig (2020)** in United States concluded that extraversion had statistically significant negative association with fear of cancer recurrence. Similarly, agreeableness and neuroticism have been found to be statistically significant positive predictors of fear of cancer recurrence.

Conclusion:

In light of the study's findings and answer of research question, it was concluded that the more than half of the studied breast cancer survivors had high level of fear of cancer recurrence and about two thirds of them had moderate intensity extraversion of personality traits. Additionally, personality traits extraversion was statistically significant negative predictor for (FCR) While, agreeableness and neuroticism were statistically significant positive predictor for (FCR)

Recommendations:

Based on the study findings, it was recommended to:

- Encourage breast cancer survivors to develop self awareness and explore their personality traits to strengthen resilience.
- An understanding of the big five personality traits, combined with the implementation of tailored interventions enables breast cancer survivors to enhance their quality of life and face survivorship challenges with improved resilience and well being.
- Further research should focus on evaluating the effectiveness of personalized psychological interventions in improving resilience, emotional well being, and long term adjustment among breast cancer survivors.

AUTHOUR'S CONTRIBUTIONS:

E.G suggested that research the research concept, drafted the proposal and interviewed the sample, collected and analyzed interpreted the data, and drafted the manuscript. The researcher idea was proposed by S. M., B. S, H.H. Participated to the study by reviewing and assisting in developing the research methodology, analyzing and interpretation the data, and discussion. All authors have read and approved the final

manuscript.

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