



Int. J. New. Chem., 2022, Vol. 9, Issue 1, pp. 188-197.

International Journal of New Chemistry

Published online in <http://www.ijnc.ir/>

Open Access

Print ISSN: 2645-7237

Online ISSN: 2383-188x



Original Research Article

Psychological Factors Affecting Quality of Life of Postoperative Breast Cancer Patients

Farshad Mahdavi ¹, Ali Reza Naseri ^{2*}

¹Assistant Professor of Surgery, Department of General Surgery, Rahat Breath and Sleep Research Center, Tabriz University of Medical Sciences, Tabriz, Iran. (Orcid: 0000-0001-6900-5852)

²Assistant Professor of Radiotherapy, Department of Radiology, Rahat Breath and Sleep Research Center, Tabriz University of Medical Sciences, Tabriz, Iran. (Orcid: 0000-0001-9714-2379)

Received: 2021-10-13

Accepted: 2021-11-14

Published: 2021-11-19

ABSTRACT

Mastectomy is a surgical procedure that can adversely affect mental health aspects and even quality of life (OOL) of patients. However, more research is needed to address this issue. This study hence aimed to investigate the psychological factors affecting OOL of breast cancer patients after mastectomy. This descriptive correlational study was conducted on 360 women (180 healthy women in the control group and 180 mastectomized women in the case group) at hospitals affiliated to Tabriz University of Medical Sciences (TUOMS) from 2018 to 2020. The participants were selected using convenience sampling and the data were collected using the Beck Anxiety Inventory, the Beck Hopelessness Scale, the Beck Depression Inventory, the Eysenck Personality Inventory (EPI), and the SF-36 Quality of Life Questionnaire. Finally, the data were statistically analyzed using descriptive and inferential statistical tests. The results showed that the mastectomized patients (the case group) experienced higher levels of anxiety, hopelessness, and depression and poorer personality traits compared to the normal women (the control group). As a result, QOL was lower in mastectomized patients than in the control group. The study findings suggested higher prevalence of mental illnesses among the mastectomized women because they experienced higher levels of anxiety, hopelessness, and depression and exhibited much poorer personality traits. All these variables reduced the QOL of such women.

Keywords: Quality of Life; Depression; Mastectomy; Psyche .

Introduction

Diagnosis and treatment of breast cancer has considerable physiological effects on women [1]. The post-diagnosis fear of death, hopelessness, and low QOL in patients with breast cancer may increase their negative emotions and attitudes. Therefore, fear of relapse, personality changes, doubts, infertility, decreased self-esteem, sexual problems, economic concerns, family problems, and emotional problems may develop among women with breast cancer after initial treatment [2, 3]. Studies show that 20-35% of women with breast cancer experience psychiatric disorders such as depression and anxiety at different periods of their illness regardless of the stage of the disease and treatment status [4]. Burgess *et al.* conducted a study on 222 patients in the early stages of breast cancer and reported that the prevalence of depression and anxiety was 33% at diagnosis, 15% one year after diagnosis, and 45% during the recurrence period. They also showed that the duration of anxiety or depression in women with breast cancer was twice that of the general female population [5]. Although most previous studies indicated that one-third of patients still suffered from psychiatric disorders even one year after treatment [6], recent studies have shown that psychiatric illnesses are directly associated with increased symptoms, decreased treatment adherence, and reduced QOL [7-9]. Nevertheless, it is assumed that there is an association between personality and the risk of breast cancer, and the long-term survival of patients with breast cancer directly depends on their personality traits [10]. A study that investigated patients with breast cancer using the EPI showed that the risk of death was lower in highly extroverted patients. Available findings demonstrate that personality traits can greatly affect the progression of breast cancer [11]. As a personality trait, neuroticism is often considered to be associated with various aspects of breast cancer survival such as fatigue, poor QOL and depression. It has also been emphasized that, in addition to being cured of breast cancer, the patient's personality, disease acceptance, and neuroticism are also among the factors affecting the emergence of depression symptoms one year after a mastectomy [12]. Post-chemotherapy fatigue in patients with breast cancer is associated with psychosis, extroversion and introversion, neuroticism, and EPI subscales, however, this association has not been accurately determined yet [13]. Few studies have dealt with the relationship between personality traits and QOL in patients with breast cancer. Therefore, this study was designed to determine the effects of personality traits, anxiety, depression, and hopelessness on QOL of patients with breast cancer in order to determine the share that influential personality traits, which are among the most important psychological factors in the life of patients with breast cancer, have on their QoL.

Methodology

This descriptive correlational study was conducted on 180 women with breast cancer aged 18 to 65 years as the case group. They had visited the outpatient clinics of Imam Reza, Ghazi Tabatabaei, and Shahid Madani Hospitals (affiliated with TUOMS). In addition, 180 healthy women were selected as the control group so that age and gender matched between the two groups. The inclusion criteria for the case group were being 18- 65 years of age, literate, willing to participate in the study, and affected by breast cancer grade 1, 2, or 3. The exclusion criteria were mental retardation, drug or alcohol addition, any other types of cancer, a history of schizophrenia or any psychotic disorders, dementia or any cognitive impairment, any neurological diseases such as epilepsy, multiple sclerosis (MS), or Parkinson's disease, or any systemic disease that could lead to cognitive impairment. The matched control group included participants who were 18-65 years old, literate and willing to take part in the study. Using the Cochran formula, taking into account the population size of 500, and considering an attrition rate of 5% and a margin of error of 5%, the sample size was determined ($n=360$). Convenience sampling was employed to select 180 mastectomized women (the case group) and 180 healthy women (the control group). The data were collected for both groups using a research tool consisting of five parts: a demographic form, the Beck hopelessness Scale, the Beck Anxiety Inventory, the Beck Depression Inventory, the Eysenck Personality Inventory (EPI), and the SF-36 Quality of Life Questionnaire. The demographic form consisted of items on age, marital status, educational level, employment status, smoking status, alcohol consumption, use of psychotropic substances, use of narcotics, medical history of the patients and of their relatives. Developed by Beck *et al.* (1985) to measure the level of hopelessness, the Becks Hopelessness Scale consists of 20 Yes/No questions that receive the scores of 1 and 0, respectively. The total score on this scale ranges between 0 and 20, and higher scores indicate higher levels of hopelessness [14]. The validity and reliability of this instrument have also been confirmed in Iran. The determined Cronbach's alpha score for its reliability in Iran is 0.79 [15].

Developed by Beck *et al.* (1988) to distinguish anxiety from depression, the Beck Anxiety Inventory measures the intensity of physical and cognitive anxiety symptoms that the patient experiences. It consists of 21 items scored using a 4-point Likert scale (0: not at all, 1: mildly, 2: moderately, and 3: severely). The total score on this Inventory ranges between 0 and 63, and scores of 0-7, 8-15, 16-25, and 26-63 indicate minimal, mild, moderate, and severe levels of anxiety, respectively [16]. The validity and reliability of this instrument have also been studied and confirmed in Iran. Its determined Cronbach's alpha score for Iranian populations is 0.92 [17]. The Beck Depression Inventory, developed by Beck *et*

al. in 1961, consists of 21 items each receiving a score of 0 to 3. The total score ranges between 0 and 63 and higher scores represent more severe depression [18]. This inventory has been repeatedly employed in Iranian studies where its Cronbach's alpha score is 0.93 [19]. The Eysenck Personality Inventory (EPI) is a self-report instrument that can measure personality traits such as extraversion, neuroticism and psychosis. It also includes a lie scale [20]. The EPI has been used in various studies in Iran where its reliability (0.75) and validity are acceptable [21]. Developed to measure QOL in people with physical illnesses and mental disorders as well as in healthy individuals, the SF-36 Quality of Life questionnaire consists of 36 items in 8 subscales: physical functioning, social functioning, role physical, role emotional, mental health, vitality, bodily pain, and general health. The total score on this instrument ranges between 0 and 133 and higher scores indicate better QOL [22]. This questionnaire has been employed in various studies in Iran where its Cronbach's alpha score is 0.82 [23]. Like other descriptive studies conducted at TUOMS, all ethical considerations were observed in this research. Moreover, it was approved by the Ethics Committee at TUOMS. Statistical analyses were performed in SPSS 19. The descriptive data were reported as mean \pm standard deviation and the mean values of variables were compared by using the one-way analysis of variance (ANOVA). Moreover, Levine's test and the chi-square test were employed to examine the homogeneity of variances and the relationship between variables, respectively. It is noteworthy that the significance level was set at $p < 0.05$.

Findings

This study was conducted on 180 women with breast cancer after mastectomy (as the case group) and 180 healthy women with similar demographics (as the control group). The mean age of participants was 52.39 ± 7.80 years in the case group and 51.96 ± 7.23 years in the control group. There was no significant difference between the two groups in terms of smoking status, psychotropic drugs or alcohol consumption, and medical history of the patients and their relatives ($p > 0.05$). Table 1 presents the individual and social information on the participants.

Table 1: Individual and social information on the participants

Variable	Case group	Control group	P-Value
Age	51.40 \pm 7.49	50.99 \pm 7.40	0.229
Education level			0.551
Elementary	36 (20%)	40(22.22%)	
Junior high school	50(27.77%)	54(30%)	
Senior high school	40(22.22%)	36(20%)	
University graduates	54(30%)	50(27.77%)	

Marital status	Single	38(21.11%)	36(20%)	0.359
	Married	142(78.89%)	144(80%)	
Job status	Housewife	112(62.22%)	118(65.55%)	0.411
	Employed	68(37.78%)	62(34.45%)	

The results revealed significant differences between the two groups in personality traits, anxiety, depression, and QOL ($p < 0.05$). The women in the case group were more depressed and anxious and experienced lower QOL compared to those in the control group. In addition, extraversion, neuroticism, psychosis, and lying were more common among women in the case group. However, there was no significant difference between the two groups in the level of hopelessness ($p > 0.05$). Table 2 provides the mean scores of these subscales and the relationship between them in both groups.

Table 2: Mean scores for depression, hopelessness, anxiety, QOL, and personality traits and the relationship between them

Variable	Case group	Control group	P-value
Depression	9.87±6.43	4.14±3.55	0.001
Hopelessness	4.18±3.06	3.03±3.14	0.088
Anxiety	14.19±9.47	6.36±4.45	0.001
Physical functioning	19.74±3.91	70.45±3.85	0.001
Role physical	6.84±1.11	20.94±15.63	0.001
Bodily pain	9.03±2.74	69.50±15.89	0.001
General health	20.78±2.74	60.96±20.15	0.001
Vitality	13.33±2.25	47.52±12.36	0.001
Social functioning	7.85±1.85	59.10±8.15	0.001
Role emotional	4.41±1.09	28.03±10.36	0.001
Mental health	24.25±3.48	60.18±10.14	0.001
Neuroticism	13.03±5.55	3.96±1.05	0.001
Extraversion	11.81±3.26	2.11±1.11	0.001
Psychosis	6.52±3.19	2.03±1.03	0.001
Lying	11.41±4.25	3.18±1.15	0.001

The results of correlation between QOL and other variables in the case group demonstrated that there were negative correlations between all dimensions of QOL and neuroticism, depression, hopelessness, and anxiety whereas there were positive correlations between extroversion and all dimensions of QOL.

However, there were negative correlations between psychosis and only two dimensions of QOL (i.e., role emotional and vitality) whereas there was a positive correlation between lying and three dimensions of QOL (i.e., physical functioning, role emotional, and vitality). The results of the correlations between dimensions of QOL and personality traits, depression, anxiety, and hopelessness are shown in Table 3.

Table 3: The results of the correlations between dimensions of QOL and personality traits, depression, anxiety, and hopelessness in the case group

Variables		Physical functioning	Role physical	Bodily pain	General health	Vitality	Social functioning	Role emotional	Mental health
Neuroticism	r	-0.148	-0.149	-0.222	-0.241	-0.244	-0.106	-0.241	-0.225
	p	0.014	0.076	0.016	0.0552	0.014	0.141	0.008	0.005
Extraversion	r	0.071	0.089	0.151	0.0441	0.202	0.155	0.115	0.306
	P	0.413	0.455	0.169	0.66	0.044	0.072	0.145	0.006
Psychosis	r	0.021	-0.036	0.019	0.141	-0.141	0.075	0.095	0.114
	P	0.896	0.755	0.801	0.134	0.303	0.551	0.445	0.159
Lying	r	0.023	0.059	-0.071	-0.045	0.118	-0.055	-0.021	-0.095
	P	0.709	0.681	0.551	0.619	0.222	0.603	0.866	0.369
Depression	r	-0.309	-0.445	-0.356	-0.425	-0.665	-0.259	-0.403	-0.666
	P	0.004	0.008	0.001	0.006	0.005	0.008	0.004	0.005
Hopelessness	r	-0.291	-0.303	-0.109	-0.333	-0.445	-0.105	-0.204	-0.101
	P	0.055	0.000	0.155	0.002	0.001	0.192	0.007	0.131
Anxiety	r	-0.440	-0.300	-0.299	-0.271	-0.490	-0.139	-0.300	-0.444
	P	0.001	0.006	0.004	0.010	0.001	0.177	0.003	0.101

The results of analysis of correlations between personality traits and depression, hopelessness, and anxiety, showed that there were positive correlations between neuroticism and depression and hopelessness and anxiety, but the other personality traits exhibited negative correlations with depression, hopelessness, and anxiety (Table 4).

Table 4: The results of correlations between personality traits and depression, anxiety, and hopelessness in the case group

Variables		Anxiety	Depressio n	Hopelessness
Neuroticism	r	0.400	0.219	0.391
	P	0.001	0.029	0.001
Extravers ion	r	-0.255	-0.069	-0.121
	P	0.013	0.570	0.269
Psychosis	r	-0.119	-0.110	-0.036

	P	0.240	0.300	0.670
Lying	r	-0.118	-0.070	-0.111
	P	0.280	0.439	0.319

Discussion

Breast cancer is one of the most common cancer among women and accounts for 33% of all cancer cases and 20% of deaths in women [24]. The main causes of psychological problems in patients with breast cancer are doubts about the success of treatment, physical symptoms, fear of relapse and death, changes in gender identity, body structure, and gender-based functions, difficulty in doing everyday life activities, family problems, and lack of emotional support [4, 25, 26]. Depression and anxiety are the most common types of mental disorders [8]. The prevalence of comorbid depression in patients with breast cancer is more than 46%, and it is even higher in the first year following initial diagnoses [27]. It is interesting that about 15% of patients with breast cancer exhibit symptoms of depression even 5 years after the initial diagnosis [28]. Depressive disorders can negatively affect psychosocial compromise, reduce QOL, and lower the survival rate of patients with breast cancer [8]. A study about the effects of pathogens and health-related QOL on depression showed that depression affected wellbeing, social duties, emotional functioning, pain, sleep disorders, and nausea [29]. It has been reported that anxiety and depression can negatively affect QOL and the fight against cancer in women with breast cancer. Moreover, social support, especially from the family, can reduce symptoms of depression and improve QOL in such patients [30]. Another study on the relationship between anxiety and QOL in patients with breast cancer demonstrated that physical, emotional, social, and cognitive weaknesses could exacerbate the conditions of patients with anxiety symptoms, and anxiety showed a positive correlation with physical condition, hope for the future, and sexual functioning [31]. In this study, statistically significant differences were found between the case and control groups in anxiety, depression, and QOL. Based on the analysis of the correlations between QOL and symptoms of depression in patients with breast cancer, it can be stated that impairments of performance and QOL are among the factors that influence emergence of the signs of depressive state. A similar study showed QOL could affect the symptoms of depression, anxiety, and hopelessness as well as personality traits [32]. It has been reported that the high levels of anxiety in patients with breast cancer can lower physical function and other types of functions during and after treatment and also negatively affect the patient's emotional aspects of life. Furthermore, higher levels of depression can weaken one's physical, social, and emotional functions [33]. Another study similar to this research reported a negative correlation between anxiety and depression level and

all aspects of QOL in cancer patients [34]. Although few studies have discussed whether there is a difference between patients with breast cancer and others in personality traits, it is generally assumed that personality traits can affect traumatic life events including cancer [35]. Neuroticism, as one of the subscales of the EPI, is highly associated with various aspects of breast cancer survival such as fatigue, poor QOL, and depression [36]. A number of previous studies reported no difference between women with breast cancer and their healthy peers in terms of extroversion and neuroticism, whereas some researchers suggested that women with breast cancer showed more psychotic states than healthy women did [37]. However, cancer survivors, including breast cancer survivors, experience lower levels of psychosis because of their poor QOL [38]. Another study indicates that psychosis is a personality trait that predicts depressive and physical symptoms in breast cancer survivors [39]. This study showed that the women with breast cancers gained higher scores on neuroticism, psychosis, extroversion, and lying compared to the healthy women did. Additionally, neuroticism exhibited a positive relationship with depression and anxiety scores, and more extroverted patients experienced lower levels of depression. Studies have demonstrated that patients with a higher neuroticism score experience lower QOL [40]. Patients with breast cancer who exhibit symptoms of personality disorders are more likely to develop psychological conditions such as post-treatment anxiety and depression [41]. This study showed a negative correlation between neuroticism and all aspects of QOL, but it found a positive correlation between extroversion and all aspects of QOL. In other words, neurotic breast cancer patients exhibited signs of depression and anxiety, which lowered their QOL. Two strengths of this study were dealing with the main aspects of QoL and investigating the relationship between personality traits and QoL in women with breast cancer. Therefore, the study findings can help the development of interventions to improve the personality traits of such patients.

Conclusion

This study showed that the high levels of anxiety, depression, and hopelessness in patients with breast cancer reduced their QoL. Higher scores on anxiety and depression indicated poorer QOL in more nervous patients. It was also observed that extroverted patients had higher QOL and lower levels of depression and anxiety. It can be hence concluded that more extroverted patients experience less depression and anxiety and enjoy better QOL, whereas more nervous patients exhibit more symptoms of depression and anxiety and experience poorer QOL. Given that the patients with breast cancer may develop mental illnesses and experience lower QOL because of their personality traits, it is very

important to identify the exact psychological characteristics of such patients and empower them to receive psychiatric help in order to go through a successful course of treatment.

References

1. J. Fabian, H. Nakazumi, M. Matsuoka, *Chemical Reviews*, 92, 1197 (1992).
2. R. R. Lunt, V. Bulovic, *Applied Physics Letters*, 98, 113305 (2011).
3. K. Kwon, T. Son, K. J. Lee, B. Jung, *Lasers in Medical Science*, 24, 605 (2009).
4. A. Bera, D. Bagchi, S. K. Pal, *The Journal of Physical Chemistry A.*, 123, 7550 (2019).
5. Z. Shoujun, H. Zhubin, T. Rui, C.Y. Bryant, Y. Qinglai, Z. Su, O. K. Dale, N. Gang, S. Haitao, L.A. Alexander, C. Xiaoyuan, *Advanced Materials*, 30, 1 (2018).
6. F. Tahmaszade, H. R. Shamlouei, *Solar Energy*, 188, 1031 (2019).
7. P. Brogdon, H. Cheema, J.H. Delcamp, *ChemSusChem.*, 11, 86 (2018).
8. C.M. Marian, M. Etinski, V. Rai-Constapel, *J. Phys. Chem. A.*, 118, 6985 (2014).
9. X. Zhan, A. Facchetti, S. Barlow, T.J. Marks, M.A. Ratner, M.R. Wasielewski, S.R. Marder, *Adv. Mater.*, 23, 268 (2011).
10. U. Mayerhffer, K. Deing, K. Größ, H. Braunschweig, K. Meerholz, F. Würthner, *Chem. Int. Ed.*, 48, 8776 (2009).
11. Z. Chen, U. Baumeister, C. Tschierske, F. Würthner, *Chem. Eur. J.*, 13, 450 (2007).
12. G. Fan, L. Yang and Z. Chen, *Front. Chem. Sci. Eng.*, 8, 405 (2014).
13. A. Loudet, K. Burgess, *Chem. Rev.*, 107, 4891 (2007).
14. S-C.n Lee, D. Zhai, Y-T. Chang, *Tetrahedron Letters*, 54, 2976 (2013).
15. S. Zhu, J. Zhang, G. Vegesna, F-T. Luo, S.A. Green, *Liu H. Org. Lett.*, 13, 438 (2011).
16. N. Boens, V. Leen, W. Dehaen, F, *Chem. Soc. Rev.* 4, 1130 (2012).
17. T. Kowada, H. Maeda, K. Kikuchi, *Chem. Soc. Rev.* 44, 4953 (2015).
18. A. Kamkaew, SH. Lim, HB. Lee, L. Voon Kiew, LY. Chung, K. Burgess, *Chem. Soc. Rev.* 42, 77 (2013).
19. SG. Awuahab, Y. You, *RSC Adv.* 2, 11169 (2012).
20. W. Qin, M. Baruah, A. Stefan, M. Van der Auweraer, N. Boens, *ChemPhysChem.* 6, 2343 (2005).
21. D. Frath, JE. Yarnell, G. Ulrich, FN. Castellano, R. Ziessel, *ChemPhysChem.* 14, 3348(2013).
22. G. Ulrich, A. Barsella, A. Boeglin, S. Niu, R. Ziessel, *ChemPhysChem.* 15, 2693 (2014).

23. ML. Agazzi, JE. Durantini, NS. Gsponer, AM. Durantini, SG. Bertolotti, EN. Durantini, *Chem Phys Chem*, 20, 1110 (2019).
24. Z-H. Pan, G-G. Luo, J-W. Zhou, J-X. Xia, K. Fang, R-B. Wu, *Dalton Trans.*, 43, 8499 (2014).
25. J. Kabatc, B. Jedrzejewska, A. Bajorek, and J. Paczkowski, *J. Fluoresc*, 16, 525 (2006).
26. EN. Kaya, B. Köksoy, S. Yeşilot, M. Durmuş, *Dyes and Pigments*, 172, 107867 (2020).
27. Y. Liu, L. Yang, C. Ma, A. Tangb, *Dyes and Pigments*, 173, 107981 (2020).
28. A. Ortiz, *Dyes and Pigments*, 171, 107690 (2019).
29. T. Rappitsch, I. Klimant, S.M. Borisov, *Dyes and Pigments*, 174, 108037 (2020).
30. T. Xu, C. Yan, Y. Wu, C. Yuan, X. Shao, *Dyes and Pigments*, 168, 235 (2019).
31. Z. Khanjari, B. Mohtat, R. Ghiasi, H. Djahaniani, F. K. Behbahani, *Main Group Chemistry*, 20, 59 (2021).
32. R. Ghiasi, Z. Zandiyeh, *Inorganic Chemistry Communications*, 124, 108412 (2021).
33. M. Nilchi, R. Ghiasi, E. Mohammadi Nasab. *Journal of the Chilean Chemical Society*, 64, 4360 (2019).
34. P. Parsa, R. Ghiasi, A. Marjani. *Inorganic Chemistry Communications*, 127, 10849 (2021).
35. M. Kiani, R. Ghiasi, H. Pasdar, B. Mirza. *Russian Journal of Physical Chemistry A*, 94, 345 (2020).
36. M. Kiani, R. Ghiasi, H. Pasdar, B. Mirza. *Journal of Molecular Liquids*, 300, 112327 (2020).
37. M. Laine, N. A. Barbosa, A. Kochel, B. Osiecka, G. Szewczyk, T. Sarna, P. Ziólkowski, R. Wieczorek, A. Filarowski. *Sensors and Actuators B: Chemical*, 238, 548 (2017).
38. N. Shajari, R. Ghiasi, M. Soltani, A. R. Kazemizadeh, *Int. J. New. Chem.*, 7, 283 (2020).
39. Z. Jianzhang, K. Xu, W. Yang, Z. Wang, F. Zhong. *Chemical Society Reviews*, 44, 8904 (2015).
40. V. Daneshdoost, R. Ghiasi, A. Marjani. *Russian Journal of Physical Chemistry A*, 94, 2594 (2020).
41. Y. Zhao, D.G. Truhlar, *Theor. Chem. Acc.*, 120, 215 (2006).

How to Cite This Article

Farshad Mahdavi, Ali Reza, Naseri, “**Psychological Factors Affecting Quality of Life of Postoperative Breast Cancer Patients**” *International Journal of New Chemistry*., 2022; DOI: 10.22034/ijnc.2022.1.16.