Factors Predictive of Quality of Life among Breast Cancer Patients

Amira Daldoul¹*, Wieme Khechine¹, Hanene Bhi², Nouha Ammar¹, Rym Bouriga³, Mohamed Wassim Krir³, Said Soltani¹, Olfa Zoukar³, Mohamed Salah Rhim⁵, Sarra Bouslah⁶, Sabrine Dimassi¹, Ibtissem Abbess¹, Zahra Saidani⁵, Sonia Zaied¹

Abstract

Background: Due to progress in medical care, the number of survivors from cancer has increased significantly during recent years and this raises the question of the quality of life (QoL), especially of the many women treated for a breast cancer. This paper focuses on correlations of QoL with anxiety and depression on the one hand and with socio demographic, anatomo-clinical and therapeutic parameters on the other. Methods: In this cross-sectional study, seventy patients were enrolled and filled in two auto-questionnaires, both in validated Arabic versions: The SF-36 for assessment of QoL and the Hospital Anxiety and Depression Scale (HAD-S) for evaluation of anxiety and depression. The statistical approaches used to determine predictive factors were bivariate correlations to determine relationships between quantitative variables, and T-tests and one-way Anova to analyze links between qualitative and quantitative variables. Results: The QoL of patients was altered with an SF-36 mean total score of 54.0 ± 22.7, and the alteration affects the different aspects. The mean scores for anxiety and depression in patients were 6.91 ± 4.72 and 6.24 ± 3.88, respectively. The results of this study suggested an association between the QoL and chemotherapy (p= 0.014) and its adverse effects (p=0.01), as well as anxiety (p= 0.0001) and depressive symptoms (p= 0.0001). Socio-demographic factors, the stage of the cancer, and surgery, radiotherapy or hormone therapy did not appear to have significant effects. Conclusion: The management of breast cancer patients needs a collaborative approach between oncologists, gynecologists, psychologist and psychiatrists.

Keywords: Breast cancer- quality of life- anxiety- depression

Asian Pac J Cancer Prev, 19 (6), 1671-1675

Introduction

Breast cancer is a major public health problem because of its frequency, its cost, its severity and its impact on the physical and psychological health (Jemal et al., 2010). In Tunisia, breast cancer ranks first among women’s cancers with a rate of 30%.

Diagnosis and treatment’s considerable progress in breast cancer have contributed to a significant increase in the patients’ survival. Nowadays, breast cancer is becoming almost a chronic disease controlled by a long-term treatment. Thanks to these progresses, patients’ quality of life is becoming more and more important and its evaluation is of increasing interest (Zainal et al., 2013). Despite this, few studies have investigated prospectively the quality of life of patients with breast cancer using standardized and validated instruments.

This paper will focuses on evaluating the quality of life of women with breast cancer and its correlation with anxiety and depression on the one hand, and with socio demographic, anatomo-clinical and therapeutic parameters on the other hand.

Materials and Methods

This was a cross-sectional study carried out between December 2016 and June 2017. Patients were recruited in the medical oncology department at the Fattouma Bourguiba University Hospital of Monastir in Tunisia.

Inclusion criteria were: giving informed consent to participate in the study; histological Evidence of breast tumor malignancy; age between 18 and 70 years; ability to read and understand Arabic language.

¹Department of Medical Oncology, ¹Department of Child Psychiatry, Fattouma Bourguiba University Hospital of Monastir, ²Department of Medical Oncology, ³Department of Radiotherapy, Farhat Hached University Hospital of Sousse, ⁴Department of Psychiatry, Principal Military Hospital of Instruction, Tunis, ⁵Department of Gynecology, El Omrane University Hospital of Monastir, Tunisia. *For Correspondence: amira.krir@outlook.com
Exclusion criteria were: severe cognitive impairment (such as Alzheimer’s disease); serious psychiatric disorders (such as psychosis); and visual, auditory or serious language disturbances that can affect the ability to properly answer the questionnaire. Following these criteria, 70 patients were enrolled in the study.

Data concerning the age; the educational level; the marital status; the psychiatric and organic personal history; the tumor characteristics and the therapeutic data were collected through interviewing the patients and from their medical records. Then, the patients filled two auto-questionnaires:

- The SF-36, in its validated Arabic version, for the assessment of the quality of life. This questionnaire includes 36 items divided into 8 dimensions (physical functioning, physical role functioning, body pain, general health perceptions, vitality [energy/fatigue], social role functioning, emotional role functioning, mental health). Each item is weighted to obtain a score between 0 (worst quality) and 100 (best quality) for each of the 8 dimensions. The scores of the questions that deal with each specific area of the functional health status are calculated on the average to get a final score in each of the 8 dimensions measured. We have used the threshold value of Lean in considering that an overall mean score lower than 66.7 indicated an impaired quality of life (Nicholson and Bigal, 2008).

- The Hospital Anxiety and Depression Scale (HAD-S), in its validated Arabic version, for the evaluation of anxiety and depression. This scale was developed by Zigmond and Snait in 1983 (Zigmond and Snaith, 1983) and is composed of 14 items assessing the anxiety symptoms (7 items) and depression symptoms (7 items). Each item is rated on a four point scale ranging from 0 to 3. In addition to the two scores of anxiety (HADS-A) and depression (HADS-D), the HAD-S allows a categorical distribution in 3 levels: normal level (absence of depression or anxiety) for scores between 0 and 7; limit level (suspicion of depression or anxiety) for scores between 8 and 10; and pathological level (presence of depression or anxiety) for scores between 11 and 21. We have used a version translated in the Tunisian dialect, according to the recommendations of the European Institute of validation of the instruments of measurement.

Data management and analysis were performed using SPSS 24.0. The statistical tests used were: the bivariate correlation to determine the relationship between the quantitative variables, T-tests to compare between two means and one-way Anova to compare between more than two means (Level of education, marital status, cancer stage, nausea and vomiting during last 4 weeks). Significance levels were set at the 0.05 level.

For multivariate analysis, the variables that are statistically associated with the level of 0.2 (Diabetes, chemotherapy, nausea and vomiting post chemotherapy, depression and anxiety symptoms) were introduced in the multiple linear regression model.

Results

The main characteristics of the study population are illustrated in Table 1. The mean age of these patients at the time of diagnosis was 41.13 ± 13.6 years. Ninety percent of patients were married and 48.6% had a primary educational level. Twenty percent of patients had a personal history of hypertension, 17.1% had a personal history of hypercholesterolemia and 15.7% had a personal history of diabetes. Twenty-seven percent of the patients were classified Stage II and 24.3% were classified stage IV. Fifty-three percent of our patients had a curative treatment, 88.6% had a surgery of the primary tumor, 75.7% had radiotherapy, 94.3% had chemotherapy, 70% had a hormone therapy, and 15.7% had a targeted therapy.

The mean scores of anxiety and depression in patients

Table 1. Characteristics of the Study Population (n=70)

| Characteristics of the Study population | Number | Percentage (%) |
|----------------------------------------|--------|----------------|
| Marital Status                          |        |                |
| Single                                 | 5      | 7              |
| Married                                | 63     | 90             |
| Divorced                               | 2      | 2.9            |
| Level of Education                     |        |                |
| Illiterate                             | 8      | 11.4           |
| Primary school                         | 34     | 48.6           |
| Secondary school                       | 22     | 31.4           |
| Universitary                           | 6      | 8.6            |
| Stage                                  |        |                |
| Stage I                                | 17     | 24.3           |
| Stage II                               | 19     | 27.1           |
| Stage III                              | 17     | 24.3           |
| Stage IV                               | 17     | 24.3           |
| Surgery of the primary tumor           |        |                |
| Yes                                    | 62     | 88.6           |
| No                                     | 8      | 11.4           |
| Radiotherapy                           |        |                |
| Yes                                    | 53     | 75.7           |
| No                                     | 17     | 24.3           |
| Chemotherapy                           |        |                |
| Yes                                    | 66     | 94.3           |
| No                                     | 4      | 5.7            |
| Hormone Therapy                        |        |                |
| Yes                                    | 49     | 70             |
| No                                     | 21     | 30             |

Table 2. Assessments of the Quality of Life According to SF36

| Average score of SF36 | Mean ± standard deviation |
|-----------------------|---------------------------|
| Physical functioning  | 61.83 ± 26.57             |
| Physical role functioning | 25.71 ± 41.91         |
| Emotional role functioning | 51.42 ± 50.34         |
| Vitality: Energy / fatigue | 48.14 ± 27.21          |
| Social role functioning | 59.3 ± 23.98            |
| Mental health         | 67.64 ± 34.96            |
| Bodily pain            | 57.53 ± 26.03            |
| General health perceptions | 54.29 ± 25.8           |
| Total Score            | 53.95 ± 22.66            |
There was no correlation between the age of the patients and the SF-36 total score (p = 0.568). The results as shown in Table 3, indicate that there was, on the other hand, a significant correlation between the score of SF36 and the treatment by chemotherapy (p= 0.014) as well as the side effects of chemotherapy such as nausea and vomiting (p=0.01). The socio-demographic factors, the stage of the cancer, the treatment by surgery, radiotherapy or hormone therapy did not affect significantly the quality of life. There was a significant negative correlation between the SF-36 score and the HADS-D score (p= 0.0001) on one hand, and between the SF-36 score and the HADS-A score (p= 0.0001) on the other hand (Table 4).

The factors significantly associated with the quality of life in multi regression analysis were the marital status (p=0.034) and anxiety symptoms (p=0.032) (Table 5).

**Discussion**

Due to the progress of medical care, the number of survivors from cancer has increased significantly during recent years and this increase in survival rates has raised the question of the quality of life of women who had been treated for a breast cancer. This was a cross-sectional study evaluating the quality of life in a sample of 70 women with breast cancer. Taken together, the results of this study suggest that there is an association between the quality of life and chemotherapy and its adverse effects on the one hand, and the anxiety and depressive symptoms on the other hand.

There was no significant correlation between the age of patients and the quality of life in this survey. However, a review of the literature had shown that the early age (< 50 years) was considered in most of studies as a predictive factor of a worse quality of life (Jemal et al., 2010; Zainal et al., 2013).

There was a significant association between marital status and quality of life in the multi regression analysis and the divorced status was associated with a worse quality of life. This view is supported by Kim were 6.91 ± 4.72 and 6.24 ± 3.88, respectively. Depression and anxiety symptoms were certain among respectively 12.9% and 21.4% of patients.

Data from Table 2 shows that the quality of life of patients was altered with an SF-36 mean total score of 53.95 ± 22.66, and the alteration affects the different aspects.

Table 3. Evaluation of the Quality of Life According to the Various Parameters Studied

| Variables                  | Mean of the SF-36 score ± standard deviation | P value |
|----------------------------|---------------------------------------------|---------|
| Level of Education         |                                             |         |
| Illiterate                 | 40.15 ± 7.5                                 |         |
| Primary school             | 56.32 ± 3.8                                 | 0.328   |
| Secondary school           | 55.64 ± 4.8                                 |         |
| Univeristy                 | 52.73 ± 9.5                                 |         |
| Marital Status             |                                             |         |
| Single                     | 63.69 ± 14.2                                |         |
| Married                    | 53.79 ± 2.7                                 | 0.19    |
| Divorced                   | 34.79 ± 8.8                                 |         |
| Diabetes                   |                                             |         |
| Yes                        | 60.85 ± 7.2                                 | 0.2     |
| No                         | 52.37 ± 2.9                                 |         |
| HTA:                       |                                             |         |
| Yes                        | 54.16 ± 6.6                                 | 0.936   |
| No                         | 53.61 ± 3                                  |         |
| High cholesterol           |                                             |         |
| Yes                        | 52.57 ± 7.7                                 | 0.849   |
| No                         | 53.96 ± 2.9                                 |         |
| Cancer Stage               |                                             |         |
| I                          | 50.62 ± 5                                   | 0.713   |
| II                         | 58.16 ± 5.4                                 |         |
| III                        | 50.96 ± 5.3                                 |         |
| IV                         | 55.58 ± 6.2                                 |         |
| Treatment                  |                                             |         |
| Curative                   | 53.43 ± 3                                  | 0.737   |
| Palliative                 | 55.58 ± 6.2                                 |         |
| Surgery of the primary tumor|                                         |         |
| Yes                        | 55.18 ± 2.9                                | 0.208   |
| No                         | 44.4 ± 6.8                                  |         |
| Radiotherapy               |                                             |         |
| Yes                        | 54.06 ± 2.8                                 | 0.953   |
| No                         | 53.61 ± 7                                  |         |
| Chemotherapy               |                                             |         |
| Yes                        | 27.25 ± 5.1                                 | 0.014   |
| No                         | 55.57 ± 2.7                                 |         |
| Nausea Vomiting during last 4 weeks |                             |         |
| No                         | 55.6 ± 3.2                                  |         |
| Slightly                   | 63.28 ± 3                                  | 0.01    |
| Moderately                 | 48.78 ± 9.1                                 |         |
| Extremely                  | 34.18 ± 6.1                                 |         |
| Hormonetherapy             |                                             |         |
| Yes                        | 53.21 ± 3.1                                 | 0.68    |
| No                         | 55.68 ± 5.5                                 |         |

Table 4. Anxiety and Depressive Symptoms and Quality of Life

| Variables                  | Correlation between HADS score and Quality of Life (SF36 Total) | Number | Correlation of Pearson | P value |
|----------------------------|---------------------------------------------------------------|--------|------------------------|---------|
| HADS-D Score               | 70 -0.568                                                     | 0.0001 |
| HADS-A Score               | 70 -0.587                                                     | 0.0001 |

Table 5. Factors Correlated to the Quality of Life in the Multi Regression Analysis

| Variables                  | Magnitude of association (β) | Degree of significance (p value) |
|----------------------------|------------------------------|---------------------------------|
| Marital Status             | -15.14                       | 0.034                           |
| Diabetes                   | -9.07                        | 0.094                           |
| Chemotherapy               | -14.35                       | 0.152                           |
| Nausea and vomiting post chemotherapy | -2.65                      | 0.242                           |
| Depression symptoms        | -1.19                        | 0.214                           |
| Anxiety symptoms           | -1.66                        | 0.032                           |
et al., (2008) who advocated that marital difficulties are predictive of poor quality of life of patients with breast cancer.

No significant association was found between the surgery of the primary tumor and the quality of life in this survey. Weitzen et al., (1997) and Sprangers et al., (1996) noted that, in the short and in the medium term, the mastectomy is associated with a less good body image and so, with a less good quality of life. However, in the long term, much of the current literature (Ganz et al., 2002) found that the type of surgery has no impact on the quality of life.

The radiotherapy is often associated with asthenia and with skin disorders, mainly in the acute phase of radiotherapy, which may affect physical and psychological functioning (So et al., 2010). This could explain the statistically significant association identified between the radiation and the decrease in quality of life in several studies (Broeckel et al., 1998; Yen et al., 2006). In this study, no significant association was found, and it can be due to the fact that the patients of the study were not in the acute phase of radiotherapy.

In this study, the treatment by chemotherapy and the fact of having nausea and vomiting after chemotherapy were significantly associated with a worse quality of life. It may be due to the short term side effects and cardio-respiratory disorders such as congestive heart failure and pulmonary insufficiency which can occur many years after and which can seriously alter the quality of life in the long term. A number of authors Broeckel et al., (1998); Jacobsen et al., (1995) and Weitzner et al., (1997) have reported that treatment by chemotherapy had been identified as a predictive factor of worse quality of life. It affects mainly the body image and the sexual functioning, and this can impair the quality of life in the short, medium and long term. Chemotherapy is also an important risk factor for neuro-psychic dysfunctions, grouped under the term “chemo brain”. This is considered as an impairment in the memory, the concentration, the attention and the speed of the verbal expression that we can find several years after the end of the treatment (Ganz et al., 2002).

In this study, there was no significant association between hormone therapy and the quality of life. Similarly, Hopwood et al., (2007) and Dupont et al., (2007) pointed out the absence of impact of hormone therapy on the quality of life. This view is also supported by Couzi et al., (1995) who concluded that there was significantly more vaginal irritation and side effects in patients under hormone therapy than in those without hormone therapy, but the overall quality of life was not impaired at 6 months post-diagnosis.

In this study, there was a significant negative correlation between the scores of HADS-A and the SF36 on the one hand, and HADS-D and the SF36, on the other hand. This means, that women with depressive or anxious symptoms have a more impaired quality of life. Similarly, Lueboonthavatchai (2007) had established a linear correlation between the depression score and worse quality of life in the patients with cancer. This point of view is supported by the study of Massie (2004), which identified the depression as a strong determinant of the quality of life. Furthermore, the systematic review of Mols et al., (2005) based on ten studies of patients in remission of their breast cancer, asserted that these women have a higher incidence of moderate symptoms of depression compared to healthy women. In addition, these scores of depression are predictive factors of a worse quality of life in all its dimensions, except the dimension of family functioning.

In view of all that has been mentioned so far, one may suppose that the treatment of patients with breast cancer should encompass the physical, psychological and social aspects. So, the medical team should take into account the quality of life of the patient with cancer throughout the different stages of treatment.

Finally, a number of limitations need to be taken into consideration. First, these findings are limited by the cross sectional design of the study. Secondly, despite the fact that the HADS score has a specificity of 83% and is known as a good tool of screening and following the depression, the opinion of a specialist is always important to diagnose a depression or anxiety disease. In fact, the patients with high HAD-S scores have been referred to psychiatry. Finally, the interpretation of our results still faces a limitation which is the absence of a control group that would allow a better analysis of the found data.

In conclusion, the aim of this study was to assess the quality of life of women with breast cancer and to establish its correlation with anxiety and depression on the one hand, and with socio demographic, anatomo clinic and therapeutic parameters, on the other hand.

One of the most significant findings emerging from this study is that symptoms of anxiety and depression were significantly associated to an impaired quality of life. The second major finding was that chemotherapy and its side effects such as nausea and vomiting have been significantly associated with alteration of the quality of life. From those results we can emphasize that the whole caregivers’ team must get involved in the management of psychological and psychiatric issues in breast cancer patients.

Conflict of interest
The authors declare that there is no conflict of interest regarding the publication of this paper.

References
Broeckel JA, Jacobsen PB, Horton J, Balducci L, Lyman GH (1998). Characteristics and correlates of fatigue after adjuvant chemotherapy for breast cancer. J Clin Oncol Off J Am Soc Clin Oncol, 16, 1689–6.
Couzi RJ, Helzlsouer KJ, Fetting JH (1995). Prevalence of menopausal symptoms among women with a history of breast cancer and attitudes toward estrogen replacement therapy. J Clin Oncol Off J Am Soc Clin Oncol, 13, 2737–4.
Dupont A, Antoine P, Reich M, Bène C (2007). Qualité de vie et sexualité des femmes atteintes d’un cancer du sein: impact de la chirurgie et de l’hormonothérapie. Psychooncol, 1, 174–8.
Ganz PA, Desmond KA, Leadham B, et al (2002). Quality of life in long-term, disease-free survivors of breast cancer: a
follow-up study. *J Natl Cancer Inst*, **94**, 39–9.
Hopwood P, Haviland J, Mills J, et al (2007). The impact of age and clinical factors on quality of life in early breast cancer: an analysis of 2208 women recruited to the UK START Trial (Standardisation of Breast Radiotherapy Trial). *Breast Edinb Scotl*, **16**, 241–1.
Jacobsen PB, Bovbjerg DH, Schwartz MD, et al (1995). Conditioned emotional distress in women receiving chemotherapy for breast cancer. *J Consult Clin Psychol*, **63**, 108–4.
Jemal A, Center MM, DeSantis C, Ward EM (2010). Global patterns of cancer incidence and mortality rates and trends. *Cancer Epidemiol Biomarkers Prev*, **19**, 1893–7.
Kim SH, Son BH, Hwang SY, et al (2008). Fatigue and depression in disease-free breast cancer survivors: prevalence, correlates, and association with quality of life. *J Pain Symptom Manage*, **35**, 644–5.
Lueboonthavatchai P (2007). Prevalence and psychosocial factors of anxiety and depression in breast cancer patients. *J Med Assoc Thai Chotmaihet Thangphaet*, **90**, 2164–4.
Massie MJ (2004). Prevalence of depression in patients with cancer. *J Natl Cancer Inst Monogr*, **25**, 57–1.
Mols F, Vingerhoets AJJM, Coebergh JW, van de Poll-Franse LV (2005). Quality of life among long-term breast cancer survivors: a systematic review. *Eur J Cancer Oxf Engl*, **41**, 2613–9.
Nicholson R, Bigal M (2008). Screening and behavioral management: obesity and weight management. *Headache*, **48**, 51–7.
So WKW, Marsh G, Ling WM, et al (2010). Anxiety, depression and quality of life among Chinese breast cancer patients during adjuvant therapy. *Eur J Oncol Nurs Off*, **14**, 17–2.
Sprangers MA, Groenvold M, Arraras JI, et al (1996). The European organization for research and treatment of cancer breast cancer-specific quality-of-life questionnaire module: first results from a three-country field study. *J Am Soc Clin Oncol*, **14**, 2756–8.
Weitzner MA, Meyers CA, Stuebing KK, Saleeba AK (1997). Relationship between quality of life and mood in long-term survivors of breast cancer treated with mastectomy. *Care Cancer*, **5**, 241–8.
Yen JY, Ko CH, Yen CF, et al (2006). Quality of life, depression, and stress in breast cancer women outpatients receiving active therapy in Taiwan. *Psychiatry Clin Neurosci*, **60**, 147–3.
Zainal NZ, Nik-Jaafar NR, Baharudin A, Sabki ZA, Ng CG (2013). Prevalence of depression in breast cancer survivors: a systematic review of observational studies. *Asian Pac J Cancer Prev*, **14**, 2649–6.
Zigmond AS, Snaith RP (1983). The hospital anxiety and depression scale. *Acta Psychiatr Scand*, **67**, 361.

This work is licensed under a Creative Commons Attribution-Non Commercial 4.0 International License.