RESEARCH ARTICLE

QUALITY OF LIFE IN PATIENTS OPERATED FOR GYNECO-MAMMARY CANCER

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Abstract

Introduction: Quality of life (QOL) has become an important part of the medical decision along with the efficacy and safety of treatment. Cancer is a chronic disease that affects the quality of life of patients from which the idea of evaluating the QOL of patients treated in the service. This is a descriptive cross-sectional study carried out at the Mohamed VI center for the treatment of cancers of Ibn Rochd Hospital of Casablanca over a period of one year.

Results: In our study, the QOL was evaluated by the Moroccan Arabic dialect version adapted and validated to our context of the survey (FACT), the survey is divided into 5 modules (localization of the cancer): breast, cervix, endometrium, ovary and vulva. Based on the results of this study, we can conclude that the localization of the cancer does not affect the QOL of the patients, besides the concept of the quality of life of the cancer patients is a primordial element, and useful for the choice of the patients therapeutic decisions, the evaluation of the different anticancer treatments and still for the rehabilitation of the patients with cancer.

Introduction:

Cancer is a disease that has always existed. The first precise description of this disease is due to Hippocrates in the 5th century BC. He will give it the name of cancer, finding its method of spread similar to the shape of the legs of the little crab. Medicine Today has made tremendous progress. It can now actively fight against cancerous disease. Cure is possible for cancers with a good prognosis treated early. However, depending on the type of cancer, its location, its extension, and despite the constant development of therapeutics, these often only make it possible to control the disease. The patient's life is then covered with a phase of stability and progression or successive recurrences of the disease, and this until the end of his life. In Morocco, gyneco-mammary cancers represent the majority of cancers affecting women, breast cancer accounts for one third of cancers in women followed by cervical cancer, thus creating a public health problem. This article is an approach that will study the quality of life in patients...
suffering from the five most common gynecological cancers, after having been operated, represented by: breast cancer, cervical cancer, cancer of the endometrium, ovarian cancer and vulvar cancer.

Methods:--
This is a descriptive cross-sectional study type quality of life survey, by distributing questionnaires to patients with gynecological cancer at the Casablanca university hospital center "CHU Ibn Rochd" within the "Mohammed VI Center for the treatment of cancer". The main objective of this survey is to assess in these patients the consequences of the disease and the treatment on their life and their relationship with those around them. The secondary objective is to compare the influencing factors and to find a correlation between these different factors and the quality of life of our patients.

Results:--
The surveyed population consisted of; 30 (37.5%) cases of breast cancer, 20 (25%) cases of cervical cancer, 10 (12.5%) cases of endometrial cancer, 10 (12.5%) cases of cancer ovarian and 10 (12.5%) cases of vulvar cancer, with an average population age of 59.92 year. Regarding the acceptability of the questionnaires, the response rate to the questionnaire was 100%; all patients agreed to respond. The rate of patients who did not respond to the "I am satisfied with my sex life" item of the questionnaire was 37.5%. The results will be studied by each location of cancer.

Breast cancer:
The mean age of the patients in the study was 50.93 years, with extremes ranging from 23 to 69 years. The majority of patients; 17 (56.7%) were married, 2 (6.7%) were divorced, 4 (13.3%) were widowed and 7 (23.3%) were single. The majority of patients: 20 (66.7%) had children, and 10 (33.3%) of patients did not have children.

Physical well being:
I have a lack of energy: the majority of patients: 9 (30%) are a little low on energy. I have nausea: the majority of patients: 20 (70%) have no nausea at all. I find it difficult to meet the needs of my family because of my physical condition: the majority of patients: 9 (30%) have no difficulty meeting the needs of their families at all. It hurts: the majority of patients: 11 (36.67%) have no pain at all. I am bothered by the side effects of the treatment: The majority of patients: 14 (46.67%) feel very little bothered by the side effects of the treatment. I feel sick: The majority of patients: 13 (43.33%) feel very little sick. I am obligated to spend time in bed: The majority of patients: 18 (60%) do not feel obligated to spend time in bed at all. “The average number of patients who validated physical well-being is (44.76%).”

Social / family well-being:
I feel close to my friends: the majority of patients: 17 (56.67%) feel very close to their friends. I feel emotional support from my family: the majority of patients: 19 (63.33%) say they have a lot of emotional support from their family. I feel the support of my friends: the majority of patients: 18 (60%) feel very close to their friends. My family to accept my illness: the majority of patients: 22 (73.33%) say that the family has accepted their illness a lot. I am satisfied with the family communication about my disease: the majority of patients: 21 (70%) feel satisfied with the family communication about their disease. I feel close to my partner (or to the person who is my main support): the majority of patients: 11 (36.67%) feel very close to their partners. I am satisfied with my sex life: the majority of patients: 10 (66.7%) feel very satisfied with their sex life. “The average number of patients who validated social / family welfare is (55.24%).”

Emotional well-being:
I feel sad: the majority of patients: 11 (36.67%) feel a little sad. I am satisfied with the way I am managing my disease: the majority of patients: 12 (40%) say they are quite satisfied with the way they are managing their disease. I am losing hope in the fight against my disease: the majority of patients: 12 (40%) have not given up hope in the fight against their disease at all. I feel nervous: the majority of patients: 11 (36.67%) feel a little nervous. I’m afraid of dying: the majority of patients: 15 (50%) are not at all afraid of dying. I am worried that my condition is getting worse: the majority of patients: 10 (33.33%) have very little concern that their condition is getting worse. “The average number of patients who validated emotional well-being is (39.44%).”
Cervical cancer:
The mean age of the patients in the study was 53.95 years, with extremes ranging from 37 to 75 years. The majority of patients: 12 (60%) were married, 5 (25%) were divorced and 3 (15%) were widowed. All patients: 20 (100%) had children.

Physical well being:
I have a lack of energy: the majority of patients: 8 (40%) are a little low on energy. I have nausea: the majority of patients: 13 (65%) have no nausea at all. I have difficulty meeting my family's needs because of my physical condition: 9 (45%) have enough difficulty meeting their family's needs. It hurts: the majority of patients: 10 (50%) have no pain at all. I am bothered by the side effects of the treatment: The majority of patients: 8 (40%) feel very little bothered by the side effects of the treatment. I feel sick: The majority of patients: 8 (40%) feel very little sick. I am obligated to spend time in bed: The majority of patients: 9 (45%) do not feel obligated to spend time in bed at all. “The average number of patients who validated physical well-being is (46.43%)”.

Social/family well-being:
I feel close to my friends: the majority of patients: 14 (70%) feel very close to their friends. I sense emotional support from my family: The majority of patients: 14 (70%) say they have a lot of emotional support from their family. I feel the support of my friends: the majority of patients: 15 (75%) feel very close to their friends. My family to accept my illness: the majority of patients: 15 (75%) say that the family has accepted their illness very much. I am satisfied with the family communication about my disease: the majority of patients: 14 (70%) feel very satisfied with the family communication about their disease. I feel close to my partner (or to the person who is my main support): the majority of patients: 8 (40%) feel quite close to their partners. I am satisfied with my sex life: the majority of patients: 7 (50%) feel quite satisfied with their sex life. “The average number of patients who have validated social/family welfare is (64.89%)”.

Emotional well-being:
I feel sad: 5 (25%) of patients do not feel sad at all and 5 (25%) are quite sad. I am satisfied with the way I am managing my disease: the majority of patients: 8 (40%) say they are quite satisfied with the way they are managing their disease. I am losing hope in the fight against my disease: the majority of patients: 14 (70%) have not given up hope in the fight against their disease at all. I feel nervous: the majority of patients: 9 (45%) feel quite nervous. I am afraid of dying: the majority of patients: 10 (50%) are not at all afraid of dying. I am worried that my condition is getting worse: the majority of patients: 9 (45%) are not at all worried that their condition is getting worse. “The average number of patients who validated emotional well-being is (45.83%)”.

Endometrial cancer:
The mean age of the patients in the study was 51.2 years, with extremes ranging from 39 to 67 years. The majority of patients: 5 (50%) were married, 2 (20%) were divorced, 1 (10%) was widowed, and 2 (20%) were single. The majority of patients: 7 (70%) had children, and 3 (30%) patients did not have children.

Physical well being:
I have a lack of energy: the majority of patients: 4 (40%) are very low on energy. I have nausea: 8 (80%) have no nausea at all. I have difficulty meeting the needs of my family because of my physical condition: 5 (50%) have no difficulty meeting the needs of their families. I'm in pain: 5 (50%) have no pain at all. I am disturbed by the side effects of the treatment: 3 (30%) of the patients do not feel at all bothered by the side effects of the treatment and 3 (30%) of the patients are a little bothered. I feel sick: The majority 5 (50%) do not feel sick at all. I am obligated to spend time in bed: The majority 6 (60%) do not feel obligated to spend time in bed at all. “The average number of patients who validated physical well-being is (51.43%)”.

Social/family well-being:
I feel close to my friends: the majority of patients: 8 (80%) feel very close to their friends. I feel emotional support from my family: Majority of patients: 8 (80%) say they have a lot of emotional support from family. I feel the support of my friends: the majority of patients: 8 (80%) feel very close to their friends. My family to accept my illness: the majority of patients: 8 (80%) say that their family accepts their illness very much. I am satisfied with the family communication about my disease: the majority of patients: 8 (80%) feel very satisfied with the family communication about their disease. I feel close to my partner (or to the person who is my main support): the majority of patients: 8 (80%) feel very close to their partners. I am satisfied with my sex life: the majority of
patients: 8 (80%) feel very satisfied with their sex life. “The average number of patients who have validated social / family welfare is (68.57%).”

**Emotional well-being:**
I feel sad: 3 (30%) of patients do not feel sad at all and 3 (30%) of patients feel very little sad. I am satisfied with the way I am managing my disease: the majority of patients: 6 (60%) say they are very satisfied with the way they are managing their disease. I am losing hope in the fight against my disease: the majority of patients: 7 (70%) have not given up hope in the fight against their disease at all. I feel nervous: 3 (30%) of patients do not feel nervous at all and 3 (30%) of patients feel very little nervous I'm afraid of dying: the majority of patients: 4 (40%) are not at all afraid of dying. I am worried that my condition is getting worse: the majority of patients: 5 (50%) have very little concern that their condition is getting worse. “The average number of patients who validated emotional well-being is (46.67%).”

**Ovarian cancer:**
The mean age of the patients in the study was 55.2 years, with extremes ranging from 39 to 66 years. The majority of patients: 43 (70.5%) were married, 10 (16.4%) were single, 5 (8.2%) were divorced and 3 (4.9%) were widowed. The majority of patients: 6 (60%) had children, and 4 (40%) patients did not have children.

**Physical well-being:**
I have a lack of energy: the majority of patients: 4 (40%) are very little tired and 3 patients (30%) are low on energy. I have nausea: 4 (40%) have no nausea at all; 3 (30%) of patients have very little nausea. I have difficulty meeting the needs of my family due to my physical condition: 5 (50%) have some difficulty meeting the needs of their families. I'm hurting: the question is evenly split between not at all and a little bit of trouble (40/40%). I am bothered by the side effects of the treatment: The majority 5 (50%) do not feel bothered by the side effects of the treatment. I feel sick: The majority 5 (50%) of patients do not feel sick. I am obligated to spend time in bed: The majority 5 (50%) do not feel obligated to spend time in bed. “The average number of patients who validated physical well-being is (45.71%).”

**Social / family well-being:**
I feel close to my friends: the majority of patients: 8 (80%) feel very close to their friends. I feel emotional support from my family: The majority of patients: 8 (80%) say they feel emotional support from their family. I feel the support of my friends: the majority of patients: 8 (80%) feel very close to their friends. My family to accept my illness: the majority of patients: 8 (80%) say that the family to accept their illness. I feel close to my partner (or to the person who is my main support): the majority of patients: 8 (80%) feel very close to their partners. I am satisfied with my sex life: the majority of patients: 6 (60%) feel very satisfied with their sex life. “The average number of patients who have validated social / family welfare is (67.14%).”

**Emotional well-being:**
I feel sad: the majority of patients: 4 (40%) feel very sad.I am satisfied with the way I am managing my disease: the majority of patients: 5 (50%) say they are very satisfied with the way they are managing their disease. I am losing hope in the fight against my disease: the majority of patients: 4 (40%) have not given up hope in the fight against their disease at all. I feel nervous: the majority of patients: 4 (40%) say they are very nervous. I'm afraid of dying: the majority of patients: 4 (40%) have very little fear of dying. I am worried that my condition is getting worse: the majority of patients: 4 (40%) have very little fear that their condition will get worse. “The average number of patients who validated emotional well-being is (41.67%).”

**Vulva Cancer:**
The mean age of the patients in the study was 57.6 years, with extremes ranging from 40 to 80 years. The majority of patients: 6 (60%) were married, 2 (20%) were divorced and 2 (20%) were widowed. The majority of patients: 9 (90%) had children, and 1 (10%) patient had no children.

**Physical well-being:**
I have a lack of energy: 3 (30%) of patients say they have all their energy and 3 patients (30%) are quite low on energy. I have nausea: 7 (70%) do not have nausea; 2 (20%) of patients have a little nausea. I have difficulty meeting the needs of my family because of my physical condition: 3 (30%) have little difficulty meeting the needs
of their families. I'm hurting: the question is evenly split between not at all and a little bit of trouble (50/50%). I am disturbed by the side effects of the treatment: The majority of patients: 4 (44.44%) do not feel bothered by the side effects of the treatment. I feel sick: The majority of patients: 5 (50%) feel very little sick. I am obligated to spend time in bed: The majority of patients: 4 (40%) do not feel obligated to spend time in bed. “The average number of patients who validated physical well-being is (44.29%)”.

Social / family well-being :
I feel close to my friends: the majority of patients: 8 (80%) feel very close to their friends. I feel emotional support from my family: the majority of patients: 8 (80%) say they feel emotional support from their family. I feel the support of my friends: the majority of patients: 8 (80%) feel a lot of support from their friends. My family to accept my illness: the majority of patients: 8 (80%) say that their families have accepted their illness. I am satisfied with family communication about my illness: the majority of patients: 6 (60%) feel satisfied with family communication about their illness. I feel close to my partner (or to the person who is my main support): the majority of patients: 2 (28.57%) feel very close to their partners. I am satisfied with my sex life: the majority of patients: 3 (42.85%) feel quite satisfied with their sex life. “The average number of patients who have validated social / family welfare is (61.43%)”.

Emotional well-being :
I feel sad: the majority of patients: 3 (30%) feel a little sad. I am satisfied with the way I am managing my disease: the majority of patients: 6 (60%) say they are very satisfied with the way they manage their disease. I am losing hope in the fight against my disease: the majority of patients: 7 (70%) have not given up hope in the fight against their disease. I feel nervous: the question is balanced between the answers. I'm afraid of dying: the majority of patients: 6 (60%) are not afraid of dying. I fear that my condition is getting worse: the majority of patients: 7 (70%) have little fear that their condition is getting worse “The average number of patients who validated emotional well-being is (53.33%)”.

Discussion:-
It is now accepted that the objectives of cancer management are no longer limited to controlling tumor progression. In the field of cancerology, like that of chronic pathologies, the quality of life of patients has become a growing concern for clinicians, public health physicians and health economists. The patient is no longer considered from the sole clinical point of view; other parameters are taken into account such as the weight of the treatments and their toxicities, the psychological and social repercussions of the disease and of the treatment during the therapeutic phase but also in the longer term. To date, no study has focused on studying the quality of life of cancer patients in Morocco on a large scale. In addition, no work has made it possible to study the evolution of this quality of life according to the characteristics of the patients. It is within this framework that the Lalla Salmaid association for the fight against cancer launched a national study aimed at evaluating the quality of life of cancer patients. This is a prospective multicenter study with consecutive recruitment of 6,500 cancer cases in Morocco. The originality of this study will contribute to a better knowledge of the epidemiology of cancer in Morocco and its repercussions in terms of quality of life. In this work we will try to give the preliminary results of the Mohammed VI center for the treatment of cancers, while awaiting the final results of the study at the national level, with possibly the realization of other larger studies in order to elucidate this new concept. However, the statistical analysis of data.

In our series, we recruited only 80 patients suffering from the most frequent gynecological cancers according to the data of the registry of cancer of Casablanca [2], a figure which remains insufficient to properly assess this new concept and draw practical conclusions on the clinical and therapeutic significance of the results. The heterogeneity of the population concerned (family situation, social coverage, marital status, physical and mental condition, cancerous location, etc.) makes it difficult to analyze the data as well as compare our data with those in the literature while knowing that most of the studies that have been carried out in this direction are most often concerned with a specific cancerous location. Any estimate of a patient's quality of life by a doctor or other worker may be wrong or influenced by individual differences in conception of a good quality of life [3]. This is why patients should ideally answer the various questions about their quality of life themselves.

Certain characteristics inherent in patients are recognized to have an influence on psychology and quality of life. Regarding age, young cancer patients experience greater psychological distress than older patients [4-5]. This relationship has been demonstrated through several studies, as an example, a study of 304 patients with breast cancer, the overall quality of life of patients under 50 was significantly lower (P = 0.02) than that of patients over 50
[5]. Returning to our population, the quality of life remains satisfactory on certain dimensions; this could be explained by the advanced age of our patients (the median age of our population was 59.29 years), we will therefore retain age as a variable protective of the quality of life and we can explain this link between the age and the deterioration of the quality of life of cancer patients because physiological aging has an impact on the different functions and organs especially mobility and cognitive functions, adding to this the cancer itself with these risks of complications, both acute and chronic. Married people have a better adaptation than people living alone [6-7], which is consistent with our results (56.25% of patients are married). Two of the longest known and most reproducible factors related to breast cancer are the decreased risk of breast cancer with increasing parity and the increased risk with nulliparity [8]. No study has demonstrated the effect of parity on the quality of life of cancer patients, in our study there seems to be a positive relationship since it is part of the family support (77.34% of patients have children). In addition, medical coverage plays an essential role in the financial quality of life of patients, by ensuring more or less complete free care. Taking the example of a national study carried out at Prince My Abdoullah Hospital in Salé on 103 cases which aims to measure the degree of success of RAMED, showed that: concerning the satisfaction of ramedists, almost all of the interviewees (96%) affirmed that RAMED met their expectations, particularly in terms of improving access to care [9]. In our study, more than 2/3 of patients benefited from RAMED (77.5% of patients have RAMED coverage), which is a strong point in improving their quality of life. The proximity of the place of treatment has a direct impact on the quality of life, given the situation already observed with regard to the reduced mobility of our patients. A care center near the patients' homes significantly increases the quality of life (57.5% of patients lived in Casablanca). The concept of quality of life for the Moroccan population is not necessarily the same as that of other countries. For example, in a Canadian study of 202 patients from four different cultural communities with various neoplasms, the overall FACT-G (Functional Assessment Cancer Treatment) quality of life scores were very different from one community.cultural to the other, despite administering the questionnaires in the mother tongue of each patient [10]. In our study, social and especially family support is an important predictor of the quality of life of patients, while knowing that this point presents a peculiarity of Moroccan society; the patients in the majority of cases are taken care of by their relatives with support throughout the illness which explains the satisfactory level of the quality of life of our patients Confirming the results of studies carried out in this direction, as an example a study [11] which showed that social support is considered as the most useful and appreciated by subjects with cancer, compared to subjects (control group) having a less severe chronic disorder. The practice of physical activity (including working at home) has been found to be a predictor of a better quality of life. This can be explained by a desire on the part of patients to continue their activities to avoid the effects of their daily treatment as much as possible, since it is a long treatment (at least 6 months). According to some studies, moderate physical activity contributes to a better quality of life [12-13-14]. Our results confirm this observation. The majority of our patients are able to work and meet the needs of their families quite well. An association between pain and quality of life was also found in our study; the majority of our patients had very little or no pain at all, which shows that pain, if it exists, has a negative influence on quality of life. Several articles have already shown this association [15-16-17]. Sleep problems have been found as factors negatively influencing the quality demonstrated in several studies [18-19]. In our study, 55% of patients claim to have good sleep. Subjects showing high levels of optimism tend to use "problem-centered" strategies, as well as "positive reinterpretation" type strategies. They would be inclined to accept the situation, to confront it when the pessimists would rather use denial,fatalism and flight. Pozo and al illustrate these findings in their study which examines the links between coping, well-being and optimism in patients with breast cancer [20]. The patients in our study also presented a poorer quality of life, and a disturbed emotional well-being. Fear of cancer recurrence could be the cause of their concerns [21]. Indeed, according to the literature, 70% of breast cancer survivors continue to express anxiety related to a possible recurrence five years after their treatment [22]. In several studies [23-24] it has been shown that anxiety measured after surgery, regardless of the adjuvant treatment received, in patients with breast cancer, has a significant influence on quality of life. 40% of our patients say they are nervous. To summarize, physical well-being should be positively predicted by feeling able to perform physical effort, being independent and not feeling sick, and negatively by lack of energy and especially feeling incapable, to meet the needs of the family. Social / family well-being should be predicted positively by feeling close to the family, having unconditional support from family members and especially the spouse (in the case of married patients), and negatively by lack of family communication that results in a lack of support and understanding. Emotional well-being should be predicted positively by the good mood of the patient, the good management of the disease as well as the general follow-up of the case by the medical profession, and negatively by the negative affectivity and the current sequelae of the cancer (fear to die, lose the ability to have children, hair loss ...). Functional well-being should be positively predicted by the ability to perform daily tasks independently, being able to enjoy life, not to mention being able to accept illness as such, and negatively by the lack of mobility and independence in daily tasks.
Conclusion:-
Cancer is a real health problem in Morocco, both diagnostic and therapeutic. The quality of life of cancer patients is now becoming a major issue in the health field, its taking into account stems from the legitimate desire of the medical community to know how the patient experiences their disease, this partly explains the various studies and the multiplicity of scales developed in this field. Our work highlighted the impact of socio-demographic data on the quality of life of our patients, but also highlighted the influence of certain parameters directly linked to cancer disease. At the end of this work, it should be noted that there is a significant association between quality of life on the one hand and psychological and physiological variables on the other.

Conflict of interest :
The authors declare no conflict of interest.

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Consent :
Written informed consent was obtained from the patient for publication of this research study. A copy of the written consent of each patient is available for review by the Editor-in-Chief of this journal on request.

References:-
1. SEPTANS Anne-Lise  Méthodologie pour l’évaluation de la qualité de vie adaptée à la fin de vie des patients atteints d’un cancer. Thèse d’état: Université de Franche-Comté: 2014.
2. BENDAIHOU K, BOUCHBIKA Z, KOTBI S, MEGRINI S  Registre des cancers de la région du grand Casablanca 2005-2006-2007. Edition 2016.
3. AUQUIER et al  Approche théorique et méthodologique de la qualité de vie 1997.
4. Ganz PA et al  Psychosocial risk in patients with breast cancer. Med Care 1993 ;31 :419-31.
5. Wenzel LB et al  Age-related differences in the quality of life of breast carcinoma patients after treatment. Cancer 1999 ;86 :1768-74.
6. Brousse C, Boisubert B  Quality of life and scales measuring Revue de médecine interne, 2007, Pages 458-462.
7. Tavani A, Gallus S, La Vecchia C et al  Risk factors for breast cancer in women under 40 years. Eur J Cancer 1999 ; 35 :1361-7.
8. HAJJJI. M. A  Evaluation du régime d'assistance médicale au centre hospitalier préfectoral de salé : Ecole nationale de santé publique : 2014.
9. T. Conory et al  Mesure de la qualité de vie des patients atteints de cancer colorectal métastatique ; Revu de la médecine interne 2002.
10. F. Cousson  L’évolution différentielle de la maladie et de la qualité de vie de patientes atteintes d'un cancer du sein : rôle de certains facteurs psychologiques, biologiques et sociaux : une étude semi-prospective en psychologie de la santé : Bordeaux : 1997.
11. Campbell A, Mutrie N, White F, McGuire F, Kearney N  A pilot study of a supervised group exercise programme as a rehabilitation treatment for women with breast cancer receiving adjuvant treatment. Eur J Oncol Nurs 2005, 9(1) :56-63.
12.  Mock V, Frangakis C, Davidson NE, et al  Exercise manages fatigue during breast cancer treatment: a randomized controlled trial. Psychooncology 2005, 14(6) :464-477.
13.  Cramp F, Daniel J  Exercise for the management of cancer-related fatigue in adults. Cochrane Database Syst Rev 2008(2) :CD006145.
14.  Stone P, Richards M, Hardy J  Fatigue in patients with cancer. Eur J Cancer 1998, 34(11):1670-1676.
21. Jacobsen PB, Hann DM, Azzarello LM, Horton J, Balducci L, Lyman GH. Fatigue in women receiving adjuvant chemotherapy for breast cancer: characteristics, course, and correlates. J Pain Symptom Manage 1999, 18(4):233-242.

22. Nieboer P, Buijs C, Rodenhuis S, et al.

23. Fatigue and relating factors in high-risk breast cancer patients treated with adjuvant standard or high-dose chemotherapy: a longitudinal study. J Clin Oncol 2005, 23(33):8296-8304.

24. Ancoli-Israel S, Liu L, Marler MR, et al.

25. Fatigue, sleep, and circadian rhythms prior to chemotherapy for breast cancer. Support Care Cancer 2006, 14(3):201-209.

26. Berger AM, Farr LA, Kuhn BR, Fischer P, Agrawal S.

27. Values of sleep/wake, activity/rest, circadian rhythms, and fatigue prior to adjuvant breast cancer chemotherapy. J Pain Symptom Manage 2007, 33(4):398-409.

28. Pozo C, Carver CS, Noriega V, et al.

29. Effects of mastectomy versus lumpectomy on emotional adjustment to breast cancer: a prospective study of the first year post surgery. J Clin Oncol 1992, 10(8):1292-1298.

30. Lasry JC, Margolese RG.

31. Fear of recurrence, breast-conserving surgery, and the trade-off hypothesis. Cancer 1992, 69(8):2111-2115.

32. Mast ME.

33. Survivors of breast cancer: illness uncertainty, positive reappraisal, and emotional distress. Oncol Nurs Forum 1998, 25(3):555-562.

34. Vries J, Van der Steeg AF, Roukema JA.

35. Trait anxiety determines depressive symptoms and fatigue in women with an abnormality in the breast. Br J Health Psychol 2008.

36. Montgomery GH, Schnur JB, Erblich J, Diefenbach MA, Bovbjerg DH. Presurgery psychological factors predict pain, nausea, and fatigue one week after breast cancer surgery. J Pain Symptom Manage 2010, 39(6):1043-1052.