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Cancer type, major determinant of mental distress in gyneco-mammary cancer patients undergoing antineoplastic treatment: cross-sectional analysis

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Introduction: Mental health disorders are common in cancer patients. However, these disorders are still underestimated in oncology. The aim of the present study is to examine the effect of breast cancer and gynecological cancer on mental health disorders in women who have undergone nonsurgical antineoplastic treatment for gyneco-mammary cancer and to investigate the predictors of these mental disorders.

Material and Methods: A cross-sectional study was carried out on Moroccan women treated with nonsurgical treatment for breast or gynecological cancer ($N = 200$). The Hospital Anxiety and Depression Scale, Body Image Scale, Pittsburgh Sleep Quality Index, Rosenberg's Self-Esteem Scale, and Multidimensional Scale of Perceived Social Support, were used.

Results: The type of cancer had a significant effect on mental health disorders but not the age. Women with breast cancer had significantly more mental health problems than women with gynecological cancer (P-values < 0.01). The predictive model of anxiety included the effects of the following variables: having a lower school level and an advanced tumor stage. While the predictive model of depression included advanced tumor stage and disease recurrence. For poor sleep quality, the variables included were: not having an occupation and having a lower monthly income. The variables that predicted body image dissatisfaction were: being younger, being unmarried, and living in a rural area.

Conclusion: High mental distress in women with breast cancer and gynecological cancer is favored by several predictive factors. The implementation of a protocol for the assessment and management of distress is necessary in oncology departments.

Keywords: breast cancer, cancer type effect, gynecological cancer, mental distress, predictive factors

Introduction

Breast cancer and gynecological cancer are the most common cancers in women and their incidence and mortality rates are increasing worldwide[1]. Being diagnosed with breast cancer or gynecological cancer and undergoing cancer treatments such as chemotherapy, surgery, radiation therapy, and hormone therapy are sources of many physical and mental problems[2,3].

Previous studies have reported a high prevalence of anxiety and depressive disorders in women with breast cancer and

HIGHLIGHTS

- Cancer type has an effect on mental distress linked to breast and gynecologic cancer.
- Age does not have a significant effect on mental distress.
- Advanced tumor stage is among the main predictors of mental distress.

gynecological cancer[4–6]. Management of these disorders is becoming an important part of cancer care due to its positive impact on treatment adherence and its association with longer survival in women with breast cancer[7–9].

Sleep disturbances were among the most common disorders in breast cancer and gynecological cancer patients. In addition, physical and psychological problems are associated with these disorders such as anxiety and depressive symptoms, poor quality of life and impaired social functioning[10–12].

Antineoplastic treatment known as chemotherapy is among cancer treatments that cause serious side effects such as fatigue, loss of appetite, nausea, vomiting, and alopecia[13]. This alopecia is considered a difficult and traumatic experience for woman with cancer and it is also a reason for the refusal of chemotherapy treatment by some cancer patients[14,15]. Hair is considered by women as an index of femininity, beauty, and sexuality, in fact, hair loss can lead to dissatisfaction with body image and a loss of self-esteem[16,17].

In Morocco, a minority of studies have focused on the assessment of mental distress in oncology. However, to our knowledge, there are no studies addressing mental distress in

women with breast cancer and gynecological cancer after chemotherapy. Indeed, the present study seeks, on the one hand to determine the effect of cancer type and age on mental health disorders in women with breast cancer and gynecological cancer. On the other hand, to explore the predictive factors of these disorders in women with breast and gynecological cancer who have undergone nonsurgical antineoplastic treatment.

Material and methods

Study participants

A cross-sectional study was carried out over a period of 10 months; from 01 September 2020 to 30 June 2021 at a cancer treatment center in Morocco. To achieve the objectives of this study, 200 women with breast cancer or gynecological cancer were invited to participate in this study. After explaining the objectives of the study to the participants, the researcher read the questions and then checked the answers chosen by the participants. The average time spent completing the questionnaire was between 20 and 30 min. The patients were selected consecutively and distributed as follows: 100 women with breast cancer treated with nonsurgical antineoplastic treatments and 100 women with gynecological cancer who also underwent nonsurgical antineoplastic treatments. The inclusion criteria were as follows: women over 18 years of age with a confirmed diagnosis of primary breast cancer or gynecological cancer, those accepting participation in this study, and having provided written consent (for unschooled patients, verbal consent followed by a fingerprint were used as evidence of consent), those with T1–T3 tumor stages; had undergone antineoplastic treatments. Exclusion criteria included having tumor stage T4, being unable to understand and speak the Moroccan dialect, having cognitive and/or hearing loss, having a history of psychiatric disorders, have a previous diagnosis of primary cancer in other locations and have undergone surgical treatment. When writing the manuscript, the authors were checked for meeting the Strengthening the Reporting of cohort, cross-sectional and case-control studies in Surgery (STROCSS) Guidelines[18].

Measures

Socio-demographic and medical characteristics

The first part of the questionnaire consists of identifying the socio-demographic and medical characteristics of the participants: age, marital status, having children, medical coverage system, living area, education level, occupation, monthly income, disease stage, time since diagnosis, and number of antineoplastic treatments.

Hospital anxiety and depression scale

The Hospital Anxiety and Depression Scale (HADS)[19], translated and validated in Arabic[20], assesses anxiety and depressive symptoms and is widely used by researchers in the field of psychooncology. The HADS consists of two subscales of 7 items each, which give two measurement scores, the first for HADS-A anxiety (varying between 0 and 21) and the second for HADS-D depression (also varying between 0 and 21). The total HADS-T scale ranges from 0 to 42. The higher the scale scores, the more severe the symptoms of anxiety and depression. The Cronbach's

alpha for the HADS scale used in this study is 0.97 and has very good validity.

Body image scale

The Body Image Scale (BIS) was used in the present study to assess cognitive, behavioral, and affective aspects of body image in women with breast cancer and gynecological cancer following changes in appearance induced by anticancer treatment. The BIS scale score ranges from 0 (not at all) to 3 (a lot) and the final BIS score ranges from 0 (body image satisfaction) to 30 (high body image dissatisfaction)[21]. Cronbach's for this study is 0.97, which demonstrates very good reliability.

Pittsburgh sleep quality index

The Pittsburgh Sleep Quality Index was developed in English[22], then translated and validated in Arabic[23]. This scale contains seven components and consists of evaluating sleep quality during the previous month. The scale score goes from 0 to 21. The higher the score, the more severe sleep difficulties become. The Cronbach's alpha for the Pittsburgh Sleep Quality Index used in this study is 0.89, which shows good validity.

Rosenberg's Self-Esteem scale

The Rosenberg Self-Esteem Scale was used in the present study to assess self-esteem in women with breast cancer and gynecological cancer. It includes 10 items with a four-point intensity scale; the total score varies from 0 to 30 points. Higher score indicates better self-esteem while lower score indicates impaired self-esteem[24]. Cronbach's alpha for this study is 0.87 which demonstrates good reliability.

Multidimensional scale of perceived social support

The Multidimensional Perceived Social Support Scale has been used to assess the perceived social support of women with breast cancer and gynecological cancer[25]. This scale contains three subscales (family support, significant other support, and friends support). Each of these subscales is rated from 1 to 7. Lower scores indicate low social support. For the present study, the value of Cronbach's alpha is equal to 0.93 demonstrating a very good reliability of our questionnaire.

Ethical consideration

Ethical approval was obtained from the Moroccan Association for research and ethics, Research Ethics Committee, (N° 02/REC/ 20). All procedures performed in this study involving human participants were in accordance with the ethical standards of the institutional and/or national research committee. Confidentiality and anonymity criteria were met as charted by the declaration of Helsinki and its later amendments. Informed consent was obtained from all individual participants included in this study. Also, This study was registered at https://www.researchregistry. com/browse-the-registry#home/ (unique identifying number: researchregistry6567).

Data analysis

Descriptive statistics were produced to describe the socio-demographic and clinical characteristics of the participants. Qualitative variables were analyzed using Pearson's χ^2-test and

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Cramer's. Quantitative variables were analyzed using a two-way analysis of variance with cancer type and age categories as factors, and mental distress variables as dependent variables. We tested the assumptions of normality and homogeneity of variances; if they were not satisfied, we performed the Kruskal–Wallis test with post-hoc calculations. Correlation analyzes were carried out between the socio-demographic and medical characteristics and the variables of mental distress, as well as between all the variables of mental distress. Variables significantly associated with mental health disorders in the correlation analysis were entered into the multiple regression analysis to assess the impact of socio-demographic and medical characteristics on each mental distress variable. Statistical significance was set at a P-value less than 0.05. Statistical analysis was performed using the SPSS version 20.0 software.

Results

Socio-demographic and medical characteristics:

Participant characteristics are presented in Table 1. In the breast cancer category, the mean age of participants is 50.46 (13.35) years. The majority of participants are married (63%), have children (78%), live in urban area (73%), are not educated (71%), have a family income less than the minimum wage (2698DH/280 US Dollar). (52%), are not professionally active (94%) and 62% are benefiting from a Moroccan health insurance program intended for the poor population, referred to as RAMedists in the subsequent text. Most of the participants (69%) are in the T2 disease stage, have a diagnosis time that exceeds one year (54%), underwent two types of antineoplastic treatments (43%), and did not have a recurrence of their disease (94%) (Table 1).

In the gynecological cancer category, the mean age of participants is 49.62 (10.00). The majority of participants are married (54%), have children (72%), live in urban areas (58%), are uneducated (54%), have a family income less than the minimum wage (72%), and are RAMedists (96%). All women (100%) are professionally inactive. The majority of these participants were in the T3 tumor stage (46%), had a diagnosis time of less than or equal to one year (66%), underwent two types of antineoplastic treatments (59%), and did not have a recurrence of their disease (84%) (Table 1).

The relationship between socio-demographic/medical characteristics and age categories

There were statistically significant differences between a few socio-demographic variables that reflect the nature of each specific age category: young (< 50 years) and old (≥50 years). Thus, the youngest women tended to have fewer children than the oldest women (χ^2 (1) = 7.26, $P < 0.01$, V = 0.19), and were more likely to have a profession than women the oldest ($\chi2$ (1) = 6.31, $P < 0.05$, V = 0.17). In terms of medical characteristics, there was no statistically significant difference for the clinical variables between the groups except the recurrence of the disease, indeed, the youngest women tended to have more recurrence of their disease (χ^2 (1) = 9.69, $P < 0.01$, V = 0.22).

Table 1

Sociodemographic and medical characteristics of the participants.

	Breast cancer (n = 100)	Gynecological cancer (n = 100)
Age		
Global sample	50.46 (13.35) 25-80	49.62 (10.00) 24–69
Marital status (%)		
Married	63	54
Unmarried	37	46
Have children (%)		
No	22	28
Yes	78	72
Medical coverage system (%)		
RAmed	62	96
CNOPS/CNSS	38	4
Living area (%)		
Rural	27	42
Urban	73	58
Education level (%)		
illiterate/Primary/ Secondary/ High school	71	54
	29	46
Occupation (%)		
Working	6	0
Housewife/retired	94	100
Monthly income (%)		
≤2698DH	52	72
> 2698DH	48	28
Disease stage (%)		
T1	16	32
T2	69	22
T3	15	46
Time since diagnosis (%)		
< 1 an	46	66
≥ 1 an	54	34
Number of treatments (%)		
One treatment	30	35
Two treatments	43	59
Three treatments	27	6
Disease recurrence (yes) (%)	6	16

Mean (SD), range, and percentages (%).

Effect of cancer type on mental distress

Cancer type was found to have a significant effect on depression, body image disturbances, sleep disturbances, social support, and self-esteem, but age was not. Thus, women with breast cancer showed greater mental distress than women with gynecological cancer ($P < 0.01$). The data did not show a significant interaction effect between age and cancer type (Table 2).

Associations between mental health disorders, socio-demographic, and medical characteristics

All measures shown on the correlation matrix were strongly interrelated ($P < 0.01$), showing a marked comorbidity between high anxiety, high depression, high body image dissatisfaction, poor sleep quality, low self-esteem, and perceived low social support with its different categories (family, significant other, and friends) (Table 3).

There was a significant association between living area, education level, disease stage, number of antineoplastic treatments

and anxiety ($P < 0.05$). Factors significantly associated with depression were living area, education level, monthly income, occupation, medical coverage system, disease stage, number of antineoplastic treatments, and disease recurrence ($P < 0.05$). Living area, monthly income, occupation, medical coverage system, and number of antineoplastic treatments were significantly associated with sleep disorders ($P < 0.05$). For body image dissatisfaction, data showed that factors related to body image were age, marital status, living area, monthly income, and medical coverage system ($P < 0.05$). Perceived social support was significantly related to age, education level, monthly income, medical coverage system, disease stage, and number of antineoplastic treatments ($P < 0.05$). While self-esteem was significantly associated with age, living area, monthly income, occupation, medical coverage system and disease stage ($P < 0.05$).

Predictive factors of mental health distress variables

In the multiple regression analysis (Table 4), the percentage of variance explained by the six prediction models ranged from 6.8 to 28.7%. The variables that predicted anxiety symptoms were having a lower school level and an advanced tumor stage. For high depression, the variables included were: advanced tumor stage and disease recurrence. For poor sleep quality, the variables included were: not having an occupation and having a lower monthly income. The variables that predicted body image dissatisfaction were: being younger, being unmarried, and living in a rural area. For a high perception of social support, the variables included were: a higher school level, a high monthly income, and an early tumor stage. While the self-esteem prediction model did not include any variables.

Discussion

This study had two main objectives. The first objective was to examine the effect of cancer type and age factor on the level of mental distress in women with breast cancer and gynecological cancer after chemotherapy. The second objective was to look for predictors of anxiety disorders, depressive disorders, body image disorders, low self-esteem, and low perception of social support in women with breast cancer and gynecological cancer treated with nonsurgical antineoplastic treatment.

The present study found that the type of cancer had a significant effect on depressive disorders, body image dissatisfaction, sleep disturbances, self-esteem, and perception of social support unlike the age factor. In line with these findings, Linden[26] reported in a study of 10,153 cancer patients that analyzes of data by cancer type indicated significant differences in levels of distress, noting that patients with gynecological, hematological, or lung cancer had higher levels of distress. In contrast, cancer type did not have a significant effect on levels of mental distress in women with breast cancer or gynecological cancer who had radical surgery[27,28]. The divergence of these results can be explained by the difference between therapeutic approaches adopted for each group of patients.

In our study, it turned out that all mental health variables are interrelated, indicating a strong association between anxiety, depression, body image disturbances, sleep disturbances, low self-esteem, and perceived low social support. In strong agreement with our results, a descriptive study conducted by Düzgün

Table 2

Comparison of mental health disorders by type of cancer and age categories.

	Breast cancer			Gynecological cancer			Statistics
	Total ($n=100$)	<50 years ($n=58$)	≥50 years ($n=42$)	Total ($n=100$)	<50 years ($n=44$)	≥50 years ($n=56$)	
Anxiety	13.16 (4.03)	12.63 (4.07)	13.84 (3.92)	14.04 (3.96)	14.26 (4.11)	13.88 (3.88)	$F^1_{(1, 196)} = 1.32; p = 0.26$ $F^2_{(1, 196)} = 0.24; p = 0.62$ $F^3_{(1, 196)} = 1.07; p = 0.36$
Depression	10.79 (4.47)	9.96 (4.76)	11.84 (3.88)	13.38 (4.41)	13.84 (4.34)	13.04 (4.48)	Kruskal–Wallis (3) = 17.16, P=0.001
Body image dissatisfaction	9.17 (7.87)	14.29 (6.14)	2.66 (4.10)	15.58 (6.79)	15.67 (6.65)	15.51 (6.95)	Kruskal–Wallis (3) = 79.42, P=0.000
Sleep disorders	8.02 (4.24)	7.14 (3.71)	9.14 (4.64)	11.22 (3.76)	11.35 (3.52)	11.12 (3.96)	$F^2_{(1, 196)} = 29.9; p = 0.000$ $F^2_{(1, 196)} = 2.43; p = 0.12$ $F^3_{(1, 196)} = 3.84; p = 0.051$
Social support	52.77 (12.64)	54.66 (12.70)	50.36 (12.28)	44.30 (21.18)	47.12 (22.22)	42.18 (20.29)	Kruskal–Wallis (3) = 11.10, P=0.01
Self-Esteem	18.11 (5.43)	18.18 (5.37)	18.02 (5.58)	13.80 (5.42)	13.19 (4.55)	14.26 (5.99)	$F^2_{(1, 196)} = 31.74; p = 0.000$ $F^2_{(1, 196)} = 0.35; p = 0.55$ $F^3_{(1, 196)} = 0.63; p = 0.42$

Mean (SD).
F^1, type of cancer; F^2, age; F^3, interaction.

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Table 3

Association between mental health disorders, social support and self-esteem.

	Depression	Sleep disorders	Body image dissatisfaction	General social support	Family support	Significant other support	Friends support	Self-esteem
Anxiety	0.737**	0.569**	0.229**	− 0.401**	− 0.407**	− 0.459**	− 0.137	− 0.730**
Depression	−	0.576**	0.325**	− 0.466**	− 0.446**	− 0.523**	− 0.198**	− 0.736**
Sleep disorders	−	−	0.330**	− 0.489**	− 0.511**	− 0.520**	− 0.191**	− 0.696**
Body image dissatisfaction	−	−	−	− 0.178**	− 0.268**	− 0.283**	0.100	− 0.461**
General social support	−	−	−	−	0.871**	0.852**	0.770**	0.570**
Family support	−	−	−	−	−	0.697**	0.478**	0.613**
Significant other support	−	−	−	−	−	−	0.431**	0.640**
Friends support	−	−	−	−	−	−	−	0.174**

Pearson correlation test.
*$P<0.05$.
**$P<0.01$.

and Bayraktar, involving 76 patients with gynecological cancer, found that there was a significantly negative correlation between the score on the body image scale and the depression scale score, a significantly positive correlation between the body image scale score and the self-esteem score as well as a significantly negative

Table 4

Multiple Regression for mental health distress variables.

	Adjut R2	F	B (95%CI)	SE	Beta	Sr2
Anxiety	6.8%	4.65				
Constant			10.31; 15.93	1.42	− 0.16*	− 0.16
School level			− 2.45; − 0.19	0.57	0.17*	0.17
Disease stage			− 0.19; 1.73	0.39		
Depression	12.4%	4.53				
Constant			16.07; 28.82	3.23	0.15*	0.15
Disease stage			0.11; 1.86	0.44	0.20**	0.21
Disease recurrence			− 4.89; − 1.00	0.98		
PSQI	15.4%	8.23				
Constant			15.38; 24.14	2.22	− 0.29**	− 0.23
Monthly income			− 4.06; − 1.09	0.75	− 0.16*	− 0.17
Occupation			− 7.52; − 0.93	1.66		
BIS	28.7%	14.37				
Constant			25.76; 41.58	4.01	− 0.45**	− 0.45
Age			− 0.39; − 0.22	0.04	0.13*	0.14
Marital status			0.04; 4.29	1.07	− 0.13*	− 0.14
Living area			− 4.74; − 0.09	1.11		
Social support	13.2%	6.03				
Constant			31.87; 68.30	9.23	0.14	0.15
School level			0.33; 10.21	2.50	0.25	0.21
Monthly income			3.18; 15.66	3.16	− 0.15	− 0.15
Disease stage			− 7.09; − 0.43	1.68		

Model adjusted for age, marital status, school level, monthly income, living area, occupation, tumor stage, and disease recurrence.
SE, standard error; sr2, squared semi-partial correlation.
*$P<0.05$.
**$P<0.01$.
***$P<0.001$.

correlation between the self-esteem and depression score[29]. In addition, a study of 384 women with breast cancer reported that self-esteem affected the quality of life and depressive symptoms of these patients[30]. Furthermore, Wen and other researchers[31] reported, in a study of women with recurrent ovarian cancer, that social support was linked to improved symptoms of anxiety and depression and life quality. Moreover, a recent cross-sectional study of 266 breast cancer survivors in South Korea, reported that sleep duration and sleep disturbances affected anxiety, while sleep latency and subjective sleep quality affected depression[32].

Multiple regression analysis performed in the two populations of the present study revealed the socio-demographic and medical characteristics that predicted each variable of mental distress. Thus, illiteracy and an advanced tumor stage predicted anxiety. Disease recurrence and the advanced stage of the tumor predicted depression. For poor sleep quality, the predictors were: not having a professional activity and having a lower monthly income. The variables that predicted body image dissatisfaction were: being younger, being unmarried, and living in a rural area. Finally, a higher educational level, a high monthly income, and an early tumor stage predicted a high perception of social support. In this sense, the results of the present study are in agreement with previous studies reporting that advanced tumor stage was a predictor of mental distress in women diagnosed with breast cancer and gynecological cancer[27,33,34]. In the same perspective, a recent study carried out by Berger and his collaborators among women with breast and gynecological cancers, showed that women with a lower level of education and lower family income presented a greater distress[35]. Moreover, having lower socio-economic status was among the factors associated with poor sleep quality in women with gynecological cancer after radical surgery[11]. In addition, a study conducted by Chen et al[36] among women with breast cancer during the postoperative phase, mentioned that young age was a predictive factor of body image impairment. On the whole, the results of our study show the need for a program to take charge of the psychological needs of cancer patients[37].

Limitations

The present study has several limitations. First, some of the scales used (BIS, MSPSS, and RSES) were adapted in Arabic but they did

not undergo a psychometric validation process. Second, the study sample cannot be representative of the general population of Moroccan women with breast cancer and gynecological cancer. Third, the results obtained must be confirmed by a longitudinal study.

Conclusion

In order to meet the needs of cancer patients within the framework of a holistic approach, health decision-makers are called upon to implement protocols for the systematic assessment of cancer patients mental distress, involving all members of the oncology team in the practice of psychotherapeutic assessment and management as well as the integration of spouses and family members in improving patients psychological well-being.

Ethical approval

This study was conducted in a framework that respects the ethics and dignity of patients. Ethical approval was obtained from the Moroccan Association for research and ethics, Research Ethics Committee, (N° 02/REC/20). All procedures performed in this study involving human participants were in accordance with the ethical standards of the institutional and/or national research committee. Confidentiality and anonymity criteria were met as charted by the declaration of Helsinki and its later amendments. Informed consent was obtained from all individual participants included in this study.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

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Author contribution

AA: conception and design of the study; AA, OE, SA, MG: data collection; AA, AY, MM: acquisition and data analysis; AB, AA: Patients recruitment; AE, MM, AB: interpretation of data; AA, AE: drafting of the work; MM, AB, AE: revising the manuscript critically and final approval of the manuscript. All authors approved the final version of the manuscript to be submitted.

Conflicts of interest disclosure

None declared.

Research registration unique identifying number (UIN)

1. Name of the registry: research registry.
2. Unique Identifying number or registration ID: research-registry6567.

3. Hyperlink to your specific registration (must be publicly accessible and will be checked): https://www.researchregistry.com/browse-the-registry#home/

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