

# Radical Mastectomy Increases Psychological Distress in Young Breast Cancer Patients: Results of A Cross-sectional Study

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## Abstract

**The present cross-sectional study aimed to detect the effect of breast cancer surgery on the psychological state of 122 young women aged < 45 years. We found that mastectomy was an independent factor associated with greater rates of psychological distress, increasing the interest of early detection in third world countries to allow for more breast conservative procedures.**

**Introduction:** The present study aimed to detect the factors associated with psychological distress (PD) in young Moroccan patients with breast cancer, with a special focus on the type of surgical procedure. **Patients and Methods:** We collected social, demographic, and clinical data from female patients, aged < 45 years, with localized stage breast cancer who had undergone either radical mastectomy or conservative surgery and for whom adjuvant chemotherapy was indicated. We used the Hospital Anxiety and Depression Scale (HADS) to assess the psychological status. The relationship between the variables and PD was analyzed using simple and multiple logistic regression analyses.

**Results:** A total of 122 women were enrolled, of whom 41 (33.6%) had a HADS global score  $\geq 15$ . The HAD anxiety and depression subscores were  $\geq 11$  for 10 (8.2%) and 8 (6.6%) patients, respectively. On multivariate analysis, adjusted for marital status and receipt of analgesic and/or anxiolytic treatment, we found that radical mastectomy (odds ratio [OR], 5.747; 95% confidence interval [CI], 1.342-24.608), living in a difficult emotional (OR, 7.366; 95% CI, 1.727-31.41) and/or financial (OR, 16.521; 95% CI, 3.574-76.36) situation, and a lack of social and/or family support (OR, 19.617; 95% CI, 3.549-108.43) were independent factors associated with PD. **Conclusion:** Breast-conserving surgery should be performed whenever possible for young women to avoid the psychological repercussions of radical procedures.

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**Keywords:** Conservative surgery, HADS, Mastectomy, Young patients, Psychological distress

## Introduction

Cancer is a chronic medical condition commonly perceived as a serious life-threatening disease, with major effects on patients' physiologic and psychological states. Coping with this disease is not an easy task for all patients, especially for younger ones.<sup>1,2</sup> Both the

incidence of breast cancer and the chances of survival have increased in recent years, which have led to more and more women living with the psychological repercussions of the disease and its treatment.<sup>3</sup>

The term "distress" was defined by the National Cancer Center Network as a multifactorial unpleasant emotional experience of a psychological (cognitive, behavioral, emotional), social, and/or spiritual nature that can interfere with one's ability to cope effectively with cancer, its physical symptoms, and its treatment. Distress extends along a continuum, ranging from common normal feelings of vulnerability, sadness, and fears to problems that can become disabling, such as depression, anxiety, panic, social isolation, and existential and spiritual crises.<sup>4</sup> The breast is one of the attributes of the feminine body, and its loss after breast cancer surgery would certainly be considered a traumatic psychological experience.<sup>5</sup> In

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our third world context, breast conservative surgery is less frequently performed than in developed countries, mainly owing to the low proportion of early-stage breast cancer cases and the lack of a fully effective screening program.<sup>6</sup>

However, we have observed in our practice that not all young patients experience this loss with psychopathologic decompensation. Thus, questions arose regarding the proportion and characteristics of young breast cancer patients at risk of developing anxiety and/or depressive disorders. To the best of our knowledge, and to date, only 1 reported study specifically devoted to psychological distress (PD) in North African breast cancer patients.<sup>2</sup> However, that study included women of all ages and did not analyze the effect of the surgical procedure type.<sup>2</sup> Other North African studies were not specifically conducted to evaluate PD in patients with breast cancer.<sup>7,8</sup>

The present study aimed to determine the factors associated with PD in a sample of young Moroccan breast cancer patients in the postoperative setting. In particular, we sought for a link between the type of surgical procedure and the occurrence of anxiety and depressive disorders in these patients.

## Patients and Methods

We performed a cross-sectional study from May 1, 2013 to April 30, 2016 at the National Institute of Oncology, Mohammed V University in Rabat. The ethics committee of the Mohammed V University in Rabat approved the present study. All the patients included in the present study provided written informed consent. For the illiterate patients, a fingerprint was considered to indicate consent.

### Patient Selection

The names of all the patients who had undergone breast cancer surgery were collected. The inclusion criteria were ambulatory female patients, age < 45 years, localized disease, receipt of either radical mastectomy or conservative surgery, and an indication for adjuvant chemotherapy (to ensure that the patients would be seen during the chemotherapy appointments). The exclusion criteria were male gender, age > 45 years, receipt of neoadjuvant chemotherapy, and locally advanced or metastatic disease. We did not include patients who had received more than the third course of adjuvant chemotherapy at the study to avoid the influence of chemotherapy side effects on patients' psychological state.

A total of 443 female patients had undergone breast cancer surgery with curative intent during the study period. Of these patients, 76, who had received preoperative chemotherapy, and 228, who were aged > 45 years, were excluded. Of the remaining 139 patients aged < 45 years, 11 were not candidates for adjuvant chemotherapy, and 6 refused to participate in the study, for a study population of 122 patients.

All included patients had provided written informed consent to participate in the present study. They were recruited from the chemotherapy outpatient hospital and were interviewed individually in a medical consultation room. We also ensured that each woman was assessed only once.

The variables collected included age, educational level, marital status, residence, occupation, living in a difficult emotional, financial, or professional situation (the household income and social

insurance scheme were used to determine the presence of financial difficulties), social family support, receipt of analgesic or anxiolytic drugs, and the type of surgical procedure performed.

### Judgment Criteria

The psychological status of our patients was assessed using the Hospital Anxiety and Depression Scale (HADS), developed in English by Zigmond and Snaith<sup>9</sup> in 1983. It was translated and validated in Arabic in 1991 by Malasi et al.<sup>10</sup> For illiterate patients, the physician read each question and its answers and marked the selected answer. A HADS global score threshold of  $\geq 15$  was used to classify the patient as experiencing PD. A threshold subscale score of 11 was used for the anxiety (HADS-A) and depression (HADS-D) subscales.

### Statistical Analysis

Statistical analysis was performed using SPSS software version 20 for Windows. Cronbach's  $\alpha$  coefficient was calculated for the 14 items of the HADS questionnaire and the 7 items of each subscale (HADS-A and HADS-D) to measure their internal consistency and reliability. The modal values of each variable were compared regarding the HADS, HADS-A, and HADS-D using the Student independent-samples *t* test for the categories of residence, occupation, difficult situation, social family support, and drug intake. The analysis of variance test was used for the categories of educational level and marital status with the Bonferroni post hoc correction when the analysis of variance test result was significant. The relationship between the variables and PD was analyzed using simple and multiple logistic regression analyses, considering PD as a binary variable based on the HADS global score threshold of 15. A significance threshold of 0.20 on univariate analysis was chosen to include variables in the multivariate model. The error risk  $\alpha$  was set at 0.05 to assess the statistical significance of the results.

## Results

A total of 122 women were enrolled in the present study. Their mean age was  $38.5 \pm 5.6$  years (range, 26-45 years; median, 40 years). Their sociodemographic and clinical characteristics stratified by the HADS global score are listed in Table 1.

The internal consistency measurement of the HADS and HADS-A and HADS-D subscale questionnaires found a Cronbach's  $\alpha$  coefficient of 0.758, 0.592, and 0.63, respectively. Of the 122 patients, 41 (33.6%) had a HADS global score  $\geq 15$  and were, thereby, classified as having PD. The HADS-A and HADS-D subscores were  $\geq 11$  in 10 (8.2%) and 8 (6.6%) patients, respectively.

Of the 41 patients with PD, 31 had undergone radical mastectomy and 10 had undergone conservative surgery. The difference between these 2 surgical procedures types in relationship to the development of PD was statistically significant ( $P = .023$ ). Regarding nodal surgery, only 2 patients had undergone sentinel lymph node excision, and 120 had undergone classic axillary lymph node dissection. No major operative or postoperative complications had been recorded in the patients' medical records.

On multivariate analysis, adjusted for marital status and receipt of analgesic and/or anxiolytic treatment, we found that living in a difficult situation (emotional and/or financial), a lack of social and/or

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**Table 1** Sociodemographic and Clinical Characteristics of Patients Stratified by the HADS Global Score (n = 122)

Characteristic	n (%)	HADS Score	
		Mean ± SD	P Value
Education level			.737 <sup>a</sup>
Illiterate	34 (27.9)	14.7 ± 4	
Primary	43 (35.2)	14.2 ± 3.9	
Secondary	22 (18)	13.8 ± 3.4	
High	23 (18.9)	13.7 ± 3.5	
Marital status			.007 <sup>a</sup>
Single	30 (24.6)	14.6 ± 3.9	
Married	81 (66.4)	13.6 ± 3.4 <sup>b</sup>	
Divorcee	11 (9)	17.3 ± 4.8 <sup>b</sup>	
Residency			.877 <sup>c</sup>
Urban	83 (68)	14.2 ± 3.8	
Rural	39 (32)	14.3 ± 3.6	
Occupation			.308 <sup>c</sup>
No	75 (61.5)	14.5 ± 3.9	
Yes	47 (38.5)	13.8 ± 3.4	
Difficult situation			
Professional	3 (2.5)	14 ± 3.4	.924 <sup>c</sup>
Emotional	31 (25.4)	17.7 ± 4.3	<.001 <sup>c</sup>
Financial	29 (32.8)	17.1 ± 3.7	<.001 <sup>c</sup>
Family support			<.001 <sup>c</sup>
Present	96 (78.7)	13.1 ± 3	
Absent	26 (21.3)	18.1 ± 3.6	
Type of surgery			.002 <sup>c</sup>
Radical	75 (61.5)	15 ± 3.8	
Conservative	47 (38.5)	12.9 ± 3.3	
Anxiolytic and/or analgesic treatment			.19 <sup>c</sup>
No	99 (81.1)	14 ± 3.7	
Yes	23 (18.9)	15.1 ± 3.8	

Abbreviation: HADS = Hospital Anxiety and Depression Scale.

<sup>a</sup>Calculated by analysis of variance test.

<sup>b</sup>Statistically significant differences found with post hoc analysis.

<sup>c</sup>Student's independent-samples *t* test.

family support, and having undergone radical mastectomy were independent factors associated with PD. The results of univariate and multivariate analyses are listed in Table 2.

Using the HADS-A and HADS-D subscores, the type of surgical procedure was not independently associated with anxiety or depressive disorders. The only independent associated factor that emerged on multivariate analysis of the HADS-A and HADS-D subscores was living in a difficult emotional situation, with an odds ratio (OR) of 24.48 (95% confidence interval [CI], 2.32-258.77) and OR of 14.39 (95% CI, 1.27-163.34) for anxiety and depression, respectively.

## Discussion

The PD prevalence rate of 33.6% found in young Moroccan breast cancer patients was slightly greater than that reported in

African and Asian series, which reported a range of 14% to 30%.<sup>11-14</sup> It was also greater than the rate of PD found in our previous study of Moroccan breast cancer women of all age categories (26.9%).<sup>2</sup> Our rate was almost comparable to those reported in occidental country series, where they ranged from 35% to 45%.<sup>15-19</sup> However, these rates vary greatly depending on the inclusion of different disease stages, the use of different assessment methods (scales and thresholds), and sampling fluctuations.

To assess the psychological status in our study we used the HADS because its psychometric qualities have been demonstrated in several validation studies,<sup>20-24</sup> although it was not spared the criticism of a recent meta-analysis, which raised the question of its validity to detect psychological distress, especially major depressive disorders.<sup>25</sup> The HADS was chosen for the present study because it excludes any item related to somatic aspects that could be confused between physical and mental illness.

Regarding the HADS threshold score, Walker et al<sup>26</sup> reported a study in which they found that the cutoff score of 15 was more sensitive (87%) and specific (85%) than a cutoff of 14 (sensitivity, 80%; specificity, 74%), providing a positive predictive value of 0.35, which they considered optimal.<sup>26,27</sup> However, another study found that a lower cutoff score provided optimal screening properties.<sup>28</sup> In that British study of 200 patients, a HADS overall score of > 13 gave a sensitivity of 96% and specificity of 74%, providing a calculated positive and negative likelihood ratio of 3.7 and 0.054, respectively.

The reported Cronbach  $\alpha$  has varied from 0.68 to 0.93 (mean, 0.83) for the HADS-A subscale and 0.67 to 0.90 (mean, 0.82) for the HADS-D subscale,<sup>29</sup> which was close to our results (Cronbach's  $\alpha$ , 0.592 for HADS-A and 0.63 for HADS-D).

Regarding the study population, we found that young women have some specific aspects that differentiate them from older breast cancer patients. These include physical factors such as early menopause, loss of fertility, and alterations in body image. Also, psychosocial factors are present because these women are often in a relatively new relationship after a short period of separation from their parents and often have not yet had children or have young children. All of these factors, in addition to career and household stability issues.<sup>30</sup>

Concerning the alterations in body image, our study found that the type of surgery was an independent factor associated with the occurrence of PD in young women. Patients undergoing radical mastectomy had a greater risk of developing PD than those undergoing a conservative procedure. We included patients who had received 1 or 2 courses of adjuvant chemotherapy at the initiation of our study specifically to avoid the occurrence of major chemotherapy side effects (appearing from the third course and onward). Because the occurrence of chemotherapy side effects would have prevented us from focusing on the influence of the surgical procedure type on patients' psychological status. We believed this choice of timing would allow our patients to answer the questionnaire based on the psychological consequences of their surgical procedure, because their bodily appearance would not have been significantly impaired by chemotherapy side effects.

The body image forms the basis of self-esteem for young women more than for any other person. Although conservative surgery often provides acceptable cosmetic results, mastectomy is decidedly

**Table 2** Sociodemographic and Clinical Characteristics of Patients With Psychological Distress on HADS on Univariate and Multivariate Analyses

Characteristic	PD/No PD, % <sup>a</sup> (n = 41/81)	Univariate Analysis			Multivariate Analysis		
		OR	95% CI	P Value	OR	95% CI	P Value
Education level					NA	NA	NA
Illiterate	12/22 (29.3)	1	NA	NA			
Primary	16/27 (39)	1.086	0.426-2.772	.862			
Secondary	7/15 (17.1)	0.856	0.274-2.675	.789			
High	6/17 (14.6)	0.647	0.202-2.078	.465			
Marital status							
Single	9/21 (22)	1	NA	NA	1	NA	NA
Married	24/57 (58.5)	0.982	0.393-2.453	.97	5.662	0.814-39.39	.08
Divorcee	8/3 (19.5)	6.222	1.334-29.013	.02	14.852	0.846-260.59	.065
Residency				.649	NA	NA	NA
Rural	12/27 (29.3)	1					
Urban	29/54 (70.7)	1.208	0.534-2.733				
Occupation				.754	NA	NA	NA
No	26/49 (63.4)	1					
Yes	15/32 (36.6)	0.883	0.407-1.92				
Difficult situation							
Professional	1/2 (2.4)	1	NA	NA	1	NA	NA
Emotional	24/7 (58.5)	14.924	5.527-40.299	<.001	7.366	1.727-31.41	.007
Financial	21/8 (51.2)	9.581	3.695-24.843	<.001	16.521	3.574-76.36	<.001
Family support				<.001			.001
Present	18/78 (43.9)	1	NA		1	NA	
Absent	23/3 (56.1)	5.922	3.306-10.607		19.617	3.549-108.43	
Type or surgery				.025			.018
Conservative	10/37 (24.4)	1	NA		1	NA	
Radical	31/44 (75.6)	2.607	1.13-6.015		5.747	1.342-24.608	
Anxiolytic and/or analgesic treatment				.113			.189
No	30/69 (73.2)	1	NA		1	NA	
Yes	11/12 (26.8)	2.108	0.837-5.31		2.489	0.638-9.706	

Abbreviations: CI = confidence interval; NA = not applicable; OR = odds ratio; PD = psychological distress.

<sup>a</sup>Percentage calculated among the 41 patients with PD.

associated with disfigurement and a decrease in femininity and maternity. It can also lead to anxiety related to lack of acceptance from the woman's partner, with the threat of marital separation.<sup>31</sup> Moreover, some ethnic and sociocultural particularities of Moroccan society, similar to most Muslim countries in Africa, such that women will not always have the audacity to express their desire to keep the breast during surgery.<sup>32</sup>

The type of surgical procedure can also affect a patient's quality of life, as recently reported by Kamińska et al<sup>31</sup> from a Polish series. They found statistically significant differences in the patients' evaluation of their "own looks" between those who had undergone mastectomy and those who had undergone conservative surgery, with the latter providing the best assessment levels.<sup>31</sup>

In the reported data, we still find controversy regarding whether the type of surgery performed (mastectomy or breast-conserving surgery) influences patients' dissatisfaction with their body image. Although many studies found that women undergoing mastectomy

were more predisposed to experience body image dissatisfaction than those receiving conservative surgery,<sup>33,34</sup> other studies did not find the surgical procedure to be an influencing factor.<sup>35,36</sup> In our study, we demonstrated that mastectomy was related to higher HADS scores among young Moroccan breast cancer patients. Mastectomy and social factors were independent factors associated with the occurrence of PD.

In addition to operative treatment, the need for radiation therapy could also be a cause of patients worrying and developing PD. The indication for radiation therapy was not detailed in our study because it is mandatory after all breast-conserving surgery procedures but not after all radical mastectomy procedures. Thus, radiation therapy could have skewed our results if included in the analysis.

One might suggest that more mastectomy procedures are performed in our third world context because radiotherapy is not easily accessible to our patients. This is unlikely because at present 22 public and private radiotherapy centers are available in the main

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cities in Morocco. However, patients from small towns could have difficulties in reaching these centers to undergo adjuvant radiotherapy, which could influence their choice of surgical procedure.

Regarding the social factors, we found that having inadequate social and family support and living difficulties (whether emotional, financial, or professional) were associated with higher PD scores. This was consistent with the major factors associated with psychological morbidity in cancer patients described in the reported data. In the large British study reported by Carlson et al<sup>15</sup> (2776 cancer patients), of the factors studied, younger age and lower income were independently associated with greater distress levels on multivariate analysis.

Experiencing adequate social family support was found to have a positive effect on decreasing PD scores in our study, such that the lack of social family support was an independent factor on multivariate analysis. This finding is similar to that from several previous studies.<sup>37-39</sup> Nevertheless, in most of these reports, the level of perceived social support was measured using the Multidimensional Scale of Perceived Social Support questionnaire.<sup>40</sup> In a Turkish study of breast cancer patients, a lack of social support (especially from the family) was a detrimental factor in coping with breast cancer.<sup>41</sup>

Although our study achieved its set objectives, 2 limitations should be noted. The first limitation was the cross-sectional design. This does not detract from the quality of our work but instead makes it comparable to most reported studies on this topic. A recent systematic review reported that 20 of 32 studies used a cross-sectional design.<sup>42</sup> However, we admit that prospective follow-up data would have added value to our study. The second limitation was that we did not use a validated tool (eg, the Multidimensional Scale of Perceived Social Support) to assess patients' social family support level.

## Conclusion

The type of surgical procedure is a major factor influencing the psychological status of young breast cancer patients, in addition to social factors. This confirms that more effort is needed in planning widely available screening programs in third world countries to allow the detection of early-stage breast cancer and, thus, allow more young women to be eligible for breast-conserving surgery. Although Morocco is considered a "third world" country and the proportion of illiteracy proportion in our study group was high, the data were not significantly different from those reported from other "occidental" countries. This knowledge should allow researchers from nonoccidental countries to report on their findings with confidence that a number of problems, and their solutions, are present worldwide.

## Clinical Practice Points

- Controversy remains regarding the effect of the breast cancer surgery procedure on the psychological state of young patients.
- The present cross-sectional study of women aged < 45 years found that mastectomy was related to greater rates of PD and was an independent factor associated with PD on multivariate analysis, in addition to psychosocial factors.

- These findings should lead policy-makers in third world countries to reinforce breast cancer screening programs to allow for early detection and enable as many young women as possible to benefit from conservative breast cancer surgery.

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## Disclosure

The authors declare that they have no competing interests.

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