

# A cross-sectional study of anxiety and marital quality among women with breast cancer at a university clinic in western Saudi Arabia

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## ABSTRACT

**الأهداف:** لدراسة العلاقة بين نوعية العلاقة الزوجية والقلق لدى النساء المصابات بسرطان الثدي في المملكة العربية السعودية.

**الطريقة:** أجريت هذه الدراسة على عينة متتالية من 49 امرأة متزوجة مصابة بسرطان الثدي في مركز العمودي للتميز في سرطان الثدي بجامعة الملك عبد العزيز، جدة، المملكة العربية السعودية في وقت مبكر من عام 2013م. وقد تم تطبيق مقياس المستشفى للقلق والاكتئاب، ومقياس إدراك الحياة الزوجية، ومقياس نوعية الحياة الزوجية على المشاركين في الدراسة وكذلك أجاب المشاركون على أسئلة تخص البيانات الديموغرافية وخصائص السرطان.

**النتائج:** تشير أن أعراض القلق التي تشير إلى وجود مرض القلق الممكن وجدت في 10.4% والتي تشير إلى وجود مرض القلق المحتمل وجدت في 14.6% (المجموع 25%). ولا توجد علاقة بين نوعية العلاقة الزوجية ومرض القلق. وكان مرض القلق في المقام الأول مرتبطاً ومتأثراً بالتعليم المنخفض، والوضع الاجتماعي والاقتصادي المنخفض، وصغر السن.

**الخلاصة:** أظهرت الدراسة أن أعراض القلق منتشرة بين النساء المتزوجات المصابات بسرطان الثدي والآتي يتابعن بعيادة سرطان الثدي بالجامعة في المملكة العربية السعودية. وما زال هناك حاجة إلى مزيد من البحوث لتحديد ما إذا كان تشخيص سرطان الثدي يؤثر سلباً على العلاقة الزوجية، وإذا كان هذا هو السبب لوجود القلق لدى هؤلاء النساء.

**Objectives:** To examine relationship between the quality of marital relationship and anxiety among women with breast cancer (BC) in the Kingdom of Saudi Arabia (KSA).

**Methods:** This cross-sectional study recruited a consecutive series of 49 married women with BC seen in the Al-Amoudi Breast Cancer Center of Excellence at King Abdulaziz University, Jeddah, KSA in early 2013. Participants completed the Hospital Anxiety and Depression Scale, Spouse Perception Scale, and Quality

of Marriage Index forms, and answered questions on demographic and cancer characteristics.

**Results:** Anxiety symptoms indicating “possible” anxiety disorder were present in 10.4% and “probable” anxiety disorder in 14.6% (25% total). No significant relationship was found between the quality of marital relationship and anxiety symptoms ( $B=-0.04$ , standard error=0.05,  $t=-0.81$ ,  $p=0.42$ ). Anxiety was primarily driven by low education, poor socioeconomic status, and young age.

**Conclusion:** Anxiety symptoms are prevalent among married women with BC seen in a university-based clinic in the KSA. Further research is needed to determine whether a diagnosis of BC adversely affects marital relationship, and whether this is the cause for anxiety in these women.

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**B**reast cancer (BC) is the most common cause of cancer death in women worldwide,<sup>1</sup> and the Kingdom of Saudi Arabia (KSA) is no exception.<sup>2</sup> Breast cancer has become a particular problem in Arab countries due to its late stage at presentation and its increased occurrence among young women.<sup>3</sup> Both during and after treatment, even if the cancer goes into remission, concerns regarding recurrence, effect on the marital relationship, and frequent medical visits for monitoring, often result in high levels of anxiety (including post-traumatic stress-like symptoms).<sup>4-8</sup> Anxiety and other mood symptoms are not benign in women with BC, as they are associated with increased mortality and cancer recurrence.<sup>9,10</sup>

Studies in Western countries (United States, Canada, England, Australia, and Germany) indicate a prevalence of significant anxiety ranging from 4-45% in BC patients, depending on anxiety measure, cutoff score, geographical region, and time since diagnosis<sup>11-14</sup> (compared with 15-37% of cancer patients in general with anxiety during the first year after diagnosis).<sup>15</sup> The most commonly used measure of anxiety symptoms in BC patients is the Hospital Anxiety and Depression Scale (HADS), which assesses for "possible" and "probable" anxiety disorder (with a sensitivity and specificity of approximately 80%).<sup>12,16,17</sup> Using this measure, the prevalence of "probable" anxiety disorder in BC patients ranges from 2-23% and "possible" anxiety disorder is present in an additional 19-22% (21-45% combined).<sup>11,13,18</sup> Although factors that increase risk of anxiety in women with BC are poorly understood, a few studies largely from Western countries report more symptoms in younger persons and Caucasians, immigrants, those with lower education, later disease stage, and lower social support.<sup>8,11,13,19</sup> In one of the few studies from an Eastern country,<sup>20</sup> anxiety levels among BC patients from Bangkok, Thailand, were significantly higher among those with poor problem solving skills, more pain and fatigue, and poorer family functioning. Although research is limited almost entirely to the US and other Western countries, studies indicate that support from a spouse (especially emotional support) improves the adjustment of women to BC,<sup>21-25</sup> and may even impact survival.<sup>26</sup> Not all studies, however, report that having a marital partner buffers against the stress of BC.<sup>27,28</sup> The demands of caregiving, the effects of BC and its treatments on sexual relationship, and coping with psychological changes in a BC patient can all lead to lower well-being in a spouse, and decrease his ability to provide support.<sup>24</sup> Our exhaustive review of the literature uncovered several studies that have examined the prevalence of emotional reactions to BC

in the Middle East, finding that 19-73% of women had significant anxiety symptoms.<sup>22,29-34</sup> In those studies, anxiety was associated with poorer physical functioning, the presence of metastatic disease, higher education, lower social support, duration of marriage, and spouse's level of anxiety. With regard to KSA, there has been a significant increase in the incidence of BC, which occurs at a younger age than in Western countries.<sup>35</sup> A recent review of research on coping with BC, however, revealed not a single study from KSA.<sup>36</sup> Our review identified only 2 studies<sup>37,38</sup> that examined the prevalence or correlates of anxiety in Saudi cancer patients (none specifically in BC), and only one study<sup>39</sup> that examined attitudes of Saudi males toward BC. The first study examined anxiety in 30 hospitalized patients with cancer (9 with BC) at the King Khalid National Guard Hospital in Jeddah, KSA.<sup>37</sup> Researchers found that anxiety symptoms assessed by the Hamilton Anxiety Scale were significantly higher in cancer patients compared with 39 patients with a range of chronic illnesses; 3 patients with cancer (10%) had a clinical diagnosis of generalized anxiety disorder based on Diagnostic and Statistical Manual of Mental Disorders, 4th edition (DSM-IV) criteria. The second study examined non-pain symptoms in 124 cancer patients (27% with BC) at King Faisal Specialist Hospital in Riyadh, KSA.<sup>38</sup> The most frequently reported non-pain symptoms were fatigue (80%), loss of appetite (72%), dry mouth (69%), and anxiety (61%). Finally, researchers examined attitudes toward BC among males accompanying female patients to outpatient clinics at King Abdulaziz Hospital in Jeddah, KSA. When men were asked what they would do if their wives were diagnosed with BC, 9.4% said they would leave their wives.<sup>39</sup>

Given the current knowledge gap on this subject in KSA, we decided to: 1) determine the prevalence of anxiety symptoms in married women seen in an urban-based university outpatient clinic in Jeddah; 2) identify the correlates of anxiety symptoms (especially marital quality [MQ]); and 3) determine whether the relationship between MQ and anxiety differed between Saudi nationals and immigrants. We hypothesized that anxiety symptoms would be prevalent, that higher MQ would be strongly and inversely related to anxiety symptoms, and that this relationship would be particularly strong in women who were Saudi nationals (where cultural factors might have the most influence).

**Methods.** Identification of prior research studies was performed using the search terms: anxiety; BC; marital relationship; spouse; MQ; Middle East; and KSA in

various combinations. These search words were entered into PubMed and Google Scholar to locate all relevant studies. A convenience sample of women with BC (volunteers) was recruited between January 2013 and March 2013 from King Abdulaziz University's (KAU) Sheikh Mohammed Hussein Al-Amoudi Breast Cancer Center of Excellence in Jeddah, KSA. Consecutive women presenting to the outpatient clinic for initial assessment or follow-up were approached for inclusion in the study. The inclusion criteria were: age 18 to 65 years; diagnosis of BC documented in the medical record; currently married; and attending the clinic on the day that the interviewers were present in the clinic. The exclusion criteria were women without BC, those outside the age range above, those who were not currently married, and all those being seen on days and times when interviewers were not present. The average length of time that participants were diagnosed with and/or experienced symptoms of BC were 38.4 months (range 2 weeks to 180 months). The questionnaire was translated into Arabic, and was self-completed by participants. Medical students (trained by KAU psychiatry faculty on how to approach patients, obtain consent, and administer the questionnaire) explained the study to the participants and obtained informed consent before proceeding. The institutional review board of KAU Hospital approved the study following the principles of the Helsinki Declaration.

**Questionnaire.** Participants were asked regarding their age (27-65 years), nationality/citizenship (Saudi=1 versus immigrant=0), education level (none=1, primary school only=2, high school only=3, university=4, post-graduate=5), employment status (yes=1 versus no=0), and family income per month (<3,000 Saudi Arabian Riyals (SAR)=1; 3,000 to 5,000=2; >5,000=3). Also assessed were duration of illness in months (0.5-180) and type of treatment received (radiation therapy, chemotherapy, surgery).

**Anxiety.** The HADS<sup>16</sup> is a self-rated scale commonly used to measure anxiety and depressive symptoms in outpatient medical populations including those in the Middle East.<sup>30,31,32</sup> Scores of 0-7 are considered normal, 8-10 signify "possible" anxiety disorder, and 11-21 indicate "probable" anxiety disorder (range 0-21). The Cronbach's alpha for anxiety subscale (HADS-A) is reported to be high (0.85).<sup>40</sup> The reliability and validity of HADS in Arabic has been previously established.<sup>41</sup> In the current study, HADS-A subscale's alpha was 0.78 (standardized), which is above the recommended threshold of 0.70.<sup>42</sup>

**Marital relations.** Two standard scales were used to measure marital adjustment. The Spousal Perception

Scale (SPS) is a self-rated 12-item measure of emotional support and emotional strain in the relationship with a spouse.<sup>43</sup> In the present study, we administered the 6-item emotional support subscale where each item is rated from one (not at all) to 4 (a lot), with a score range from 6-24 (higher scores indicating greater perceived spousal support). The average score in the original validation study was approximately 20.<sup>43</sup> The Cronbach's alpha of the scale is reported to be 0.91.<sup>44</sup> In the present study, the internal reliability was similarly high (alpha=0.85). The second scale administered was the Quality of Marriage Index (QMI).<sup>45</sup> The QMI is a 6-item self-rated scale that assesses the "essential goodness of a relationship." Each item is rated on a scale from one (very strong disagreement) to 7 (very strong agreement) with a theoretical score range of 7-42 (higher scores indicating a more positive marital relationship). Average scores have been reported to range from 28-37, with higher scores in men.<sup>46-48</sup> Internal reliability of the QMI ranges from 0.91-0.97.<sup>44</sup> The alpha in the present sample was 0.89. For inclusion in multivariate analyses, the SPS and QMI were combined to form a 12-item scale that ranged from 6-66 (alpha=0.91). Although the psychometric properties of the Arabic versions of the above 2 scales have not been established, we chose these measures based on their "content" validity; as noted above, both scales' reliability in the present sample was acceptable.

**Statistical analyses.** The characteristics of the sample were described by means + standard deviations (SD) or percentages (Table 1). A correlation matrix (Pearson r) was constructed for all study variables (Table 2). In multivariate analyses, income was dichotomized into low (<3,000=0) versus high (>3,000=1), and education was dichotomized into low (0=no education or only primary school) versus high (one=high school or beyond). Blocks of independent variables were entered in a stepwise fashion into 3 general linear models predicting the dependent variable (anxiety symptoms): model one included only the sample demographics (age, nationality, education, employment, income); model 2 included demographics and cancer-related factors; and model 3 included demographics, cancer-related factors, and overall MQ (Table 3). Given the sample size, only independent variables significant at  $p<0.10$  were carried forward into later models. Since these analyses were largely exploratory, the significance level was set at  $p=0.05$ , and analyses were not adjusted for multiple comparisons. All analyses were performed using the Statistical Analysis System version 9.3 (SAS Institute Inc., Cary, North Carolina, USA).

**Results.** Of the 50 women approached to participate in the study, all (100%) agreed to complete the questionnaire. One participant, however, completed only part of the questionnaire, leaving a final sample of 49. The average age of participants was 48.9 (SD=7.1) years, with a range from 35-65 (Table 1). Most participants were Saudi citizens (58.3%). Three-quarters (73.5%) had graduated from high school or attended college, although only one-third (31.9%) were employed. The average yearly family income was 48,000 SAR (approximately \$12,000 per year). The average duration of illness since diagnosis of BC was 3 years (38.4 months). The most common type of cancer treatment was surgery (89.8%), followed by chemotherapy (83.7%) and radiation therapy (57.1%). Marital adjustment, on average, was low to moderate.

Perception of spouse support SPS averaged 16.7 (SD=3.9) on a theoretical range of 6-24, indicating low to moderate support compared with an average of 20 in Western samples.<sup>43</sup> The QMI averaged 31.0 (SD=5.7), indicating moderate MQ compared with scores in Western samples that have ranged from 28-37.<sup>46-48</sup> The overall quality of the marital relationship (summing the SPS and QMI) averaged 47.6 (SD=8.7) with a theoretical score ranging from 12-66. The average number of anxiety symptoms was 5.6 (SD=3.8), ranging from 0-15 (where the theoretical score range was 0-21). The prevalence of 'possible' anxiety disorder (HADS-A score 8-10) was 10.4% and 'probable' anxiety disorder (HADS-A score 11-21) was 14.6%. The most common anxiety symptom was feeling frightened something awful would happen, while the least common symptom

**Table 1 -** Characteristics of the participants included in a study on anxiety in Jeddah, Kingdom of Saudi Arabia (n=49).

Characteristics	Mean $\pm$ SD	(range)	n (%)
<i>Demographics</i>			
Nationality, Saudi			28 (58.3)
Age, years	48.9 $\pm$ 7.1	(35-65)	
Education, high school or beyond			36 (73.5)
Employment status, employed			15 (31.9)
<i>Family income per year (SAR)</i>			
<36,000			6 (12.2)
36,000-60,000			30 (61.2)
>6,000			13 (26.5)
<i>Cancer characteristics</i>			
Duration of illness, months	38.4 $\pm$ 48.9	(0.5-180)	
<i>Treatment</i>			
Radiation therapy			28 (57.1)
Chemotherapy			41 (83.7)
Surgery			44 (89.8)
<i>Anxiety</i>			
<i>Hospital Anxiety and Depression Scale-A (HADS-A) (total)</i>	5.6 $\pm$ 3.8	(0-15)	
1) Feels tense or wound up	0.8 $\pm$ 0.7	(0-3)	
2) Feels frightened: something awful will happen	1.2 $\pm$ 1.0	(0-3)	
3) Experiences worrying thoughts	0.9 $\pm$ 0.8	(0-3)	
4) Feels at ease and relaxed (reverse)	0.8 $\pm$ 0.9	(0-3)	
5) Feels frightened like butterflies in stomach	0.8 $\pm$ 0.9	(0-3)	
6) Feels restless and need to be on the move	0.7 $\pm$ 0.8	(0-3)	
7) Has sudden feeling of panic	0.5 $\pm$ 0.7	(0-2)	
HADS-A score 0-7 (no significant anxiety)			36 (75.0)
HADS-A score 8-10 (possible anxiety)			5 (10.4)
HADS-A score 11-21 (probable significant anxiety)			7 (14.6)
<i>Marital Quality</i>			
Spousal Perception Scale (SPS) (total)	16.7 $\pm$ 3.9	(6-23)	
Quality of Marriage Index (QMI) (total)	31.0 $\pm$ 5.7	(9-40)	
Total Marital Quality (SPS + QMI)	47.6 $\pm$ 8.7	(15-62)	

\*N varies by less than 5%, SAR - Saudi Arabian Riyal=(0.27 US dollars)

was having a sudden feeling of panic. Bivariate correlates of anxiety symptoms were lower education ( $r=-0.48$ ,  $p=0.0005$ ), lower income ( $r=-0.38$ ,  $p=0.007$ ), and not receiving radiation therapy ( $r=-0.32$ ,  $p=0.03$ ) (Table 2). There were weak, non-significant inverse relationships between symptoms of anxiety and the perception that the spouse cares and understands ( $r=-.21$ ,  $p=0.15$ ), perceived MQ ( $r=-0.08$ ,  $p=0.58$ ), and overall quality of the relationship ( $r=-0.15$ ,  $p=0.32$ ) (Figure 1), where average anxiety scores are plotted again MQ in decile (tenths). Multivariate analyses indicated that only age ( $B=-0.12$ , standard error [SE]=0.05,  $p=0.01$ ) and education ( $B=-4.75$ ,  $SE=1.07$ ,  $p<0.0001$ ) were

independently associated with anxiety symptoms (Table 3) Model 3. As in bivariate analyses, no significant relationship was found between the overall quality of the marital relationship and anxiety symptoms ( $B=-0.04$ ,  $SE=0.05$ ,  $t=-0.81$ ,  $p=0.42$ ). Nationality did not moderate this relationship (interaction  $B=0.07$ ,  $SE=12.7$ ,  $t=0.59$ ,  $p=0.56$ ). In other words, the inverse relationship between marital relationship quality and anxiety was not stronger in women who were Saudi citizens compared with those who were immigrants.

**Discussion.** Approximately one in 7 women (14.6%) had anxiety symptoms that were frequent

**Table 2** - Bivariate correlations between all study variables as found in a study on anxiety in Jeddah, Kingdom of Saudi Arabia.

Variables	2	3	4	5	6	7	8	9	10	11	12	13
Age	0.12	-0.13	-0.02	0.16	0.27*	0.30*	0.10	0.17	-0.18	-0.16	-0.10	-0.15
Nationality	-	0.36*	0.42*	0.48*	0.16	0.19	-0.04	0.13	-0.20	-0.13	-0.09	-0.13
Education	-	-	0.63*	0.66*	0.22	0.18	-0.04	-0.08	-0.48*	0.27*	0.30*	0.31*
Employment	-	-	-	0.31*	0.06	0.13	-0.05	0.09	-0.20	0.29*	0.15	0.26*
Income	-	-	-	-	0.38*	0.27*	-0.08	-0.03	-0.38*	0.00	0.09	0.04
Duration	-	-	-	-	-	0.59*	0.33*	0.22	-0.11	0.11	0.19	0.16
Radiation therapy	-	-	-	-	-	-	0.51*	0.25	-0.32*	-0.05	-0.01	-0.04
Chemotherapy	-	-	-	-	-	-	-	-0.15	-0.12	0.01	-0.05	-0.01
Surgery	-	-	-	-	-	-	-	-	0.02	-0.21	-0.09	-0.18
HADS-A	-	-	-	-	-	-	-	-	-	-0.08	-0.21	-0.15
QMI	-	-	-	-	-	-	-	-	-	-	0.65*	0.94*
SPS	-	-	-	-	-	-	-	-	-	-	-	0.87*
MQ-total	-	-	-	-	-	-	-	-	-	-	-	-

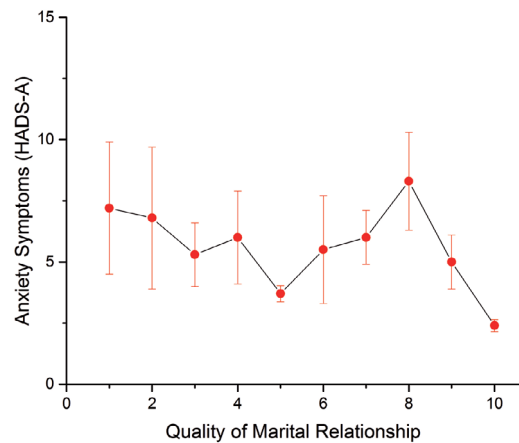
SPS - Spousal Perception Scale, QMI - Quality of Marriage Index, MQ - marital quality, MQ-total - SPS + QMI, HADS-A - Hospital Anxiety and Depression Scale-Anxiety, \* $p<0.10$ ,

**Table 3** - Multivariate model examining relationship between anxiety (HADS-A) and overall marital quality (MQ-total) of the study sample.

Demographics	Model 1		Model 2 B (SE)		Model 3
Age	-0.12	(0.05) <sup>†</sup>	-0.10	(0.05)*	-0.12 (0.05) <sup>†</sup>
Nationality	-0.97	(1.07)	---	---	---
Education	-4.33	(1.51) <sup>†</sup>	-4.60	(1.08) <sup>‡</sup>	-4.75 (1.07) <sup>‡</sup>
Employment	-0.02	(1.12)	---	---	---
Income	-2.61	(1.79)	---	---	---
<b>Illness characteristics</b>					
Duration of illness	---	---	0.01	(0.01)	---
Rx (radiation versus other)	---	---	-1.91	(1.19)	---
<b>Marital quality</b>					
MQ-total	---	---	---	---	-0.04 (0.05)
Model R-square (n)	0.43	(46) <sup>‡</sup>	0.38	(48) <sup>‡</sup>	0.35 (48) <sup>‡</sup>

HADS-A - Hospital Anxiety and Depression Scale-Anxiety, MQ-total- SPS + QMI, SPS - Spousal Perception Scale, QMI - Quality of Marriage Index, Rx - treatment, B (SE)=unstandardized beta (standard error), \* $p<0.05$ , <sup>†</sup> $p<0.01$ , <sup>‡</sup> $p<0.001$





**Figure 1** - Relationship between quality of the marital relationship and anxiety symptoms, with standard errors. HADS-A - Hospital Anxiety and Depression Scale - Anxiety subscale.

enough to qualify them for a “probable” anxiety disorder, and an additional 10.4% had symptoms on the HADS that indicated a “possible” anxiety disorder, resulting in a total of 25% with significant anxiety symptoms. This prevalence rate of anxiety symptoms is similar to that reported in Western countries using the HADS (2-23% for probable anxiety disorder; 19-22% for possible disorder, 21-45% combined), although is on the low side.<sup>11,13,18</sup> Contrary to our predictions, the quality of the marital relationship was not significantly related to anxiety symptoms, and nationality (Saudi versus immigrant) did not moderate this relationship. More important as a risk factor for anxiety were age and education. Younger women were more likely to experience anxiety symptoms, as were women with lower education, lower income, and lack of employment (which education probably acted as a proxy for in multivariate analyses). No other characteristic (including time since diagnosis) was related to anxiety symptoms.

Our failure to find a relationship between anxiety symptoms and perceived support from the spouse, or quality of the marriage may be due to several factors. First, religious and cultural traditions in this patriarchal society may have led women to accept and successfully cope with lack of spousal support, and therefore adapt to their cancer in other ways - perhaps through support from other family members, or their religious beliefs. A second possibility was our sample size, which reduced the power of this study to detect significant relationships. However, the very weak relationship between overall marital adjustment and anxiety symptoms ( $B=-0.04$ ,  $SE=0.05$ ) reduces the likelihood

that statistically or clinically significant relationships would be found even in a much larger sample. Third, women who participated in this study had been living with a diagnosis of BC for an average of 3 years and were still married. Not included were women whose diagnosis of BC led to marital discord and divorce. Such a selection effect would reduce the variability in anxiety symptoms and marital discord in our sample of married women whose marriages had endured and stabilized over time. The net effect of all these factors would be to lower our ability to detect an adverse effect of the BC diagnosis on anxiety symptoms and MQ.

The inverse relationship between age and anxiety found here has been reported by other researchers in Western countries, including studies in the United States,<sup>8</sup> Germany,<sup>13</sup> and Australia.<sup>11</sup> However, this is the first time that an inverse association has been reported in the Middle East and Far East since the published studies from Iran<sup>31</sup> and Thailand<sup>20</sup> did not find an association between anxiety and age. There are several reasons why younger women with BC are likely to have higher levels of anxiety. First, the diagnosis of BC at a young age is not “on time” as it might be in later life when cancer is more common and expected. Having one’s life cut short by cancer can interfere with future dreams and hopes for family and work. Second, having BC diagnosed at a young age during the reproductive years can interfere with body image (following mastectomy), female identity, and sexual intimacy, and convey a sense of loss of control that may increase anxiety levels. Younger women may also be less likely to agree to, and comply with hormonal therapies that interfere with their sexual activity,<sup>49</sup> and may cause premature menopause,<sup>50</sup> increasing anxiety toward the course of the cancer and premature mortality. Finally, the strongest risk factor we identified for anxiety was lower education. Again, this finding is consistent with reports from Western countries, such as Germany<sup>13</sup> and Australia,<sup>11</sup> although is inconsistent with one of the only studies on anxiety in BC patients in the Middle East, where higher levels of education were associated with more anxiety (Iran).<sup>31</sup> Women with lower education may not be aware of the surgical, chemotherapeutic, and radiation therapies available that successfully cure BC or improve its prognosis, or in some instances, may not be able to afford such treatments. Imagining a death sentence with BC, or a poor prognosis when nothing can be done could certainly increase anxiety.

**Limitations.** We acknowledge several limitations of the present study. First, the sample was a relatively small convenience sample and acquired from only one university-based urban BC clinic, which limits our ability

to generalize the study findings to women with BC in rural areas, or those seeking care in other government-supported and private settings. Second, the cross-sectional nature of these analyses precludes speculation regarding the direction of effects in the relationships detected (namely, a hereditary predisposition to anxiety could just as well impair women's ability to complete their education, as lack of education could lead to greater anxiety). Third, detailed information on cancer stage, severity of disability, or interference with mobility, and the presence of other medical co-morbidities were not assessed, limiting our ability to control for these factors in multivariate analyses. Finally, the way in which anxiety was measured (by a count of symptoms and their severity) did not allow for an assessment of interference with social, occupational, or recreational functioning, precluding our ability to determine the true prevalence of anxiety disorder. Nevertheless, this study also has a number of strengths. First, we used standard psychometrically valid measures to assess anxiety symptoms and MQ, and carefully analyzed the data using stepwise multivariate statistics. Second, the use of the HADS-A to assess anxiety symptoms allows for comparison of our results with past studies, and those to be conducted in the future. Third, to our knowledge, this is the first report from KSA on the prevalence or correlates of anxiety symptoms and the relationship between MQ and anxiety symptoms in married women with BC. Given the important role that religion, cultural, and social forces play in this part of the world,<sup>51</sup> these initial preliminary findings should help to stimulate future research on anxiety in women with BC in this country and throughout the Middle East.

In conclusion, anxiety symptoms are present in a significant number of married women with BC being followed up in a university-based BC clinic in Jeddah, KSA, especially those who are younger and with lower education. Although weak trends were found in the expected direction, no significant relationship was found between perceptions of spousal support or quality of the marital relationship and anxiety symptoms. Cultural factors, low power due to sample size, high quality of care, and a selection effect may at least partially explain these findings. Given that between 15% and 25% of women with BC experience significant anxiety symptoms, these findings should stimulate clinicians to screen women with BC for anxiety and other mood symptoms, and then treat significant symptoms with psychotherapy and/or appropriate doses of a serotonin re-uptake inhibitor.

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