

The Psychological Impact of Referral for Mammography Screening for Breast Cancer Among Women in Muscat Governorate

A cross-sectional study

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التأثير النفسي للإحالة لفحص الثدي بالأشعة لسرطان الثدي بين النساء في محافظة مسقط دراسة مستعرضة

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ABSTRACT: Objectives: Breast cancer constitutes the majority of diagnosed cancers in Oman's females, accounting for 19.2%, which prompted the introduction of a breast cancer screening programme into the Omani healthcare system. There are rising international concerns about the effectiveness of mammography as a screening tool and its psychological impact. The current study aimed to determine the social, emotional and physical dysfunction caused by the waiting time from the day of scheduling the appointment until the day of screening and explore associated risk factors. **Methods:** This cross-sectional study was conducted between March and December 2017 at Khoula Hospital, Muscat, Oman, using a two-part self-administered questionnaire. Part one of the questionnaire collected clinical and demographic data. Part two consisted of the Psychological Consequences Questionnaire (PCQ) and focused on psychological consequences, measuring the effect of mammographic screening on emotional, physical and social functions. **Results:** A total of 300 women aged ≥ 40 years old participated in this study (response rate: 100%). Results revealed that there was a minimal negative psychological impact from screening using mammograms. All PCQ domains were significantly impacted for participants who reported a family history of cancer ($P = 0.007$). The social score was significantly higher among women between 40–50 years old ($P = 0.008$). Scores of emotional and social functions were significantly affected by participants' employment status; employed women were more affected than those who were not ($P = 0.043$ and 0.012 , respectively). However, women's levels of literacy did not affect any of the domains. **Conclusion:** The psychosocial impact of the waiting period between scheduling and undergoing mammography screening was minimal in the current sample. Future research should evaluate the psychosocial impact on patients at different recall times.

Keywords: Breast Cancer; Mammography; Psychological Factors; Depression; Anxiety; Oman.

المخلص: الهدف: يشكل سرطان الثدي النسبة الأعلى من السرطانات المشخصة في نساء عُمان بنسبة تعادل 19.2%، مما أدى إلى إدراج برامج الفحص المبكر للثدي في نظام الرعاية الصحية العماني. هناك مخاوف عالمية متزايدة بشأن فعالية التصوير الشعاعي للثدي كأداة فحص وتأثيره النفسي. الدراسة الحالية تهدف لمعرفة مدى التأثير العاطفي والجسدي والعجز البدني الذي ينتج من طول انتظار الموعد من يوم تحديده وحتى يوم الفحص. كما تهدف الدراسة إلى اكتشاف عوامل الخطر المرتبطة. **الطريقة:** أجريت هذه الدراسة المستعرضة بين شهر مارس وديسمبر من عام 2017 في مستشفى خولة بمحافظة مسقط، سلطنة عمان، باستخدام استبيان ذاتي يتكون من جزئين. الجزء الأول من الاستبيان تضمن البيانات السريية والديمغرافية. أما الجزء الثاني فقد تضمن استبيان العواقب النفسية وركز على العواقب النفسية، وقياس تأثير الفحص الشعاعي للثدي على النواحي العاطفية والجسدية والاجتماعية. **النتائج:** شاركت 300 امرأة تتراوح أعمارهن بين 40 سنة وأكثر في هذه الدراسة (معدل الاستجابة: 100%). كشفت النتائج أن التأثير النفسي السلبي من الفحص باستخدام تصوير الثدي بالأشعة قليل جداً. كما بينت النتائج تأثير جميع مجالات استبيان العواقب النفسية بشكل كبير للمشاركات اللاتي أبلغن عن تاريخ عائلي لمرض السرطان ($P = 0.007$). كانت النواحي الاجتماعية أعلى تأثيراً في النساء بين عمر 40–50 سنة ($P = 0.008$). تأثرت النواحي العاطفية والاجتماعية بشكل كبير بالحالة المهنية للمشاركات؛ وكانت النساء العاملات أكثر تأثراً من اللاتي لا يعملن ($P = 0.043$ و $P = 0.012$ ، على التوالي). كما أوضحت الدراسة أن المستوى التعليمي للمرأة ليس له تأثير على أي من المجالات الثلاث. **الخلاصة:** كان التأثير النفسي والاجتماعي لفترة الانتظار حتى وقت الخضوع لفحص تصوير الثدي ضئيلاً في العينة الحالية. ينصح بعمل أبحاث مستقبلية لتقييم التأثير النفسي-الاجتماعي للمرضى في حال استدعائهم لإعادة الفحص.

الكلمات المفتاحية: سرطان الثدي؛ التصوير الشعاعي للثدي؛ عوامل نفسية؛ كآبة؛ قلق؛ عمان.

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ADVANCES IN KNOWLEDGE

- The psychological effects of the waiting period between the day of referral and mammography screening were minimal.

APPLICATION TO PATIENT CARE

- The psychological impact of mammography screening suggests that patients with family history of cancer and those employed experience some degree of stress during the time between scheduling the examination and undergoing the screening.
- Employed women with a family history of cancer or aged 40–50 years may require counselling and/or referral to a psychologist prior to mammography screening to mitigate the psychological impact of the pre-screening waiting period.

BREAST CANCER IS A MAJOR CONCERN AS IT caused 410,000 deaths annually and is the leading cause of death due to cancer in women.¹ El Saghier *et al.* conducted a literature and registry analysis in the American University of Beirut Medical Centre, Beirut, Lebanon, and estimated that breast cancer represents 13–35% of all female cancers in the Arab world.² In addition, they found that women younger than 50 years old account for almost 50% of breast cancer patients in the Arab world, with a median age of 49–52 years compared to 63 years in more industrialised nations.² In 2011, the Gulf Centre for Cancer Control reported that breast cancer accounted for 23.5% of all cancers among women.³ In Oman, breast cancer constitutes the majority of cancers in women, accounting for 19.2% of cases; 53.5% of these breast cancers occur in women under the age of 50.⁴ The highest incidence of breast cancer recorded in Muscat, Oman, was in 2008, at 15.6 cases per 100,000 women.⁵

Recently, mammography screening for breast cancer has been a subject of debate and international concern due to adverse pre-screening and post-screening effects reported in different trials.^{6–8} However, the level of anxiety felt by women waiting for breast cancer screening appointments has been shown to vary, reflecting patients' varying levels of concern about breast cancer screening.⁹ The degree of pre-screening anxiety corresponds to the extent of the procedure's invasiveness as shown in a study comparing physiological impact and demographic variability in women awaiting three different medical procedures, including mammography.¹⁰ These studies also showed that the time and place of baseline assessment should be considered before drawing any conclusions about the psychological effect of breast screening, as participants are not a homogeneous entity.^{9,10}

In 2016, Oman's Ministry of Health (MOH) initiated breast cancer screening via mammography for the early detection of breast cancer. The most recent MOH guidelines recommend a programme of breast cancer screening in all low-risk Omani women that are ≥ 40 years old, which is to be repeated every two years in case of normal results. The current study

aimed to evaluate the psychological impact on women waiting for mammography screening after being referred for the procedure by their primary healthcare institution and associated risk factors.

Methods

This cross-sectional study was conducted between March and November 2017 at the Radiology Department of Khoula Hospital, Muscat, Oman, which is one of the main secondary healthcare centres in Oman. The waiting time for mammography screening for eligible women ranged from 3–4 months according to the availability of appointments. The participants in this study were undergoing their first mammographic screening.

Patients were recruited directly from the Radiology Department while waiting for their mammography appointment and included all female patients referred by their primary healthcare provider for mammography screening regardless of the waiting time since referral. Patients who were ≥ 40 years of age and able to understand and complete the self-administered questionnaire were included. Women who were pregnant, not competent to give consent, attending for a follow-up screening, had a history of breast cancer, a psychological condition or were diagnosed with depression were excluded.

The study used a two-part self-administered questionnaire. Part one collected clinical and demographic data including age, marital status, educational level and employment status. The clinical data included information about personal or family history of breast cancer. Part two was the Psychological Consequences Questionnaire (PCQ), which is a reliable and valid measure of the effect of the mammographic screening on an individual's emotional, physical and social function. It includes 12 items and three domains, with five items measuring emotional dysfunction, four items measuring physical dysfunction and three items measuring social dysfunction. The ratings for the symptoms within each of the domains were added to give a score, indicating the level of dysfunction in that domain with a higher score indicating greater dysfunction. The PCQ

has been previously utilised for psychological screening in both pre- and post-mammography screening periods.¹¹

However, since the PCQ had not been previously available in Arabic, the investigators had to translate and validate it for this study. For linguistic validation, the Arabic version was translated back into English to determine the equivalence of the concepts in the questionnaire. The Arabic version was piloted in a different hospital with 20 participants for cultural validation, including the appropriateness of the wording and potential misinterpretations; few amendments were required.

The participants were asked to complete the questionnaire and the PCQ while waiting for their mammogram in the waiting area of the Radiology Department. Any queries were answered by the investigators. For illiterate women, the questionnaire was completed by the investigators, who verbally asked the women the questions.

Descriptive statistics were computed for socio-demographic characteristics and all items in the questionnaire. The mean and standard deviation (SD) were reported for continuous variables, while frequencies and percentages were reported for categorical variables. The association of the independent variables with the outcome variables was estimated using the Kruskal-Wallis and Mann-Whitney-U tests. The two-tailed significance level was set at $P \leq 0.05$. All statistical analyses were carried out using Statistical Package for the Social Sciences (SPSS), Version 25.0 (IBM Corp., Armonk, New York, USA).

The research protocol was approved by the Research Ethics Committee of Khoula Hospital. Verbal consent was obtained from all participants after providing a full explanation of the study.

Results

A total of 300 women aged ≥ 40 years participated in this study (response rate: 100%). A total of 196 participants (65.3%) were between 40–50 years of age, while 77 women (25.7%) were between 51–60 years of age. Most participants were Omani (91%) and had graduated from university (35%). The remainder had graduated from secondary school (23%), were illiterate (22.3%) or could read and write but had not completed secondary school (19.7%). The majority of participants were married (79.3%) and unemployed (64.7%). A total of 77 women (25.7%) reported having a history of cancer in their family [Table 1].

A total of 212 women (70.7%) reported not having any social dysfunction in response to waiting for mammography screening, while 187 (62.3%) and 171 (57%) reported not having any physical or emotional

Table 1: Characteristics of women who underwent mammography screening at Khoula Hospital, Muscat, Oman (N = 300)

Characteristic	n (%)
Age in years	
40–50	196 (65.3)
51–60	77 (25.7)
>60	27 (9)
Nationality	
Omani	273 (91)
Non-Omani	27 (9)
Region of Residence	
Muscat	288 (96)
North Batinah	6 (2.1)
South Batinah	2 (0.7)
South Sharqiah	2 (0.7)
Dakhiliah	2 (0.7)
Literacy level	
University graduate	105 (35)
Secondary school graduate	69 (23)
Illiterate	67 (22.3)
Literate*	59 (19.7)
Marital status	
Married	238 (79.3)
Widowed	32 (10.7)
Single	16 (5.3)
Divorced	14 (4.7)
Employment status	
Employed	106 (35.3)
Unemployed	194 (64.7)
Family history of cancer	
Yes	77 (25.7)
No	223 (74.3)

*Did not complete secondary school.

dysfunction, respectively. Only 21 (7%), 13 (4.3%) and 12 (4%) women reported dysfunction "quite a lot of the time" in the emotional, physical and social domains, respectively. One-third of the participants reported "rarely" or "some of the time" for emotional (36.3%) and physical (32.7%) dysfunction, while only a quarter reported the same for social dysfunction (25.6%) [Figure 1].

The results showed that social dysfunction was significantly higher in respondents between 40–50

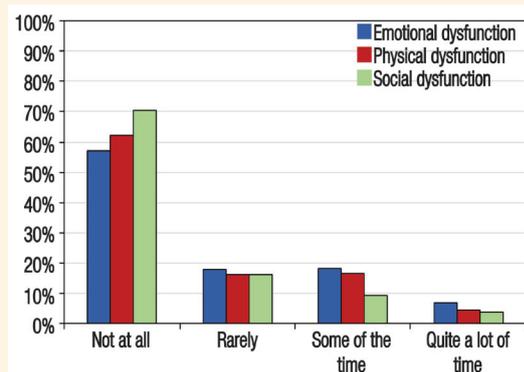


Figure 1: The psychological impact of the waiting time from the day of referral to mammography screening in women at Khoula Hospital, Muscat, Oman (N = 300).

years of age ($P = 0.008$). Literacy levels did not have a significant effect on any of the PCQ domains. Emotional and social scores were significantly affected by participants' employment status; women who were employed were significantly more affected than those who were unemployed ($P = 0.043$ and 0.012 , respectively). Marital status did not have a significant effect on any of the PCQ domains, perhaps due to the fact that most participants (79.3%) were married. Interestingly, participants who reported a history of cancer in their family had significantly higher scores in all three

domains of the PCQ ($P = 0.047$, 0.008 and 0.007 for emotional, physical and social scores, respectively) [Table 2].

Discussion

Undergoing any health-related screening exposes the patient to the possibility of an unintended adverse effect, most commonly increased anxiety.^{12,13} The negative psychological impact of waiting for mammography screening was found to be minimal in the current sample. The percentage of women reporting dysfunction in their emotional, physical or social well-being "quite a lot of the time", as measured by the PCQ, was less than 7%. This finding is similar to other studies which found low levels of anxiety.^{9,14} This might be explained by either the fact that women in the current study received good counselling at the time of referral or that mammography screening is a minimally invasive procedure.¹⁰

The present results confirmed that age has a negative effect on participants' social scores, which were significantly higher in those aged 40–50 years ($P = 0.008$). This finding might be due to the fact that younger women are more aware of disease consequences and treatments available.¹⁵ Several other studies

Table 2: Psychological Consequences Questionnaire results showing the affected psychological functions as expressed through the characteristics of women who underwent mammography screening at Khoula Hospital, Muscat, Oman (N = 300)

Characteristic	Mean emotional score \pm SD	P value*	Mean physical score \pm SD	P value*	Mean social score \pm SD	P value*
Age in years						
40–50	3.93 \pm 4.16	0.189	2.72 \pm 3.10	0.182	1.69 \pm 2.24	0.008
51–60	3.32 \pm 3.50		2.29 \pm 2.84		0.94 \pm 1.67	
>60	2.38 \pm 3.26		1.61 \pm 2.41		0.61 \pm 1.16	
Educational level						
Illiterate	3.09 \pm 3.60	0.553	2.33 \pm 2.95	0.106	1.06 \pm 1.78	0.405
Literate [†]	4.34 \pm 4.42		3.10 \pm 3.34		1.86 \pm 2.48	
Secondary school	3.58 \pm 3.89		2.94 \pm 3.14		1.41 \pm 1.95	
University graduate	3.73 \pm 3.83		1.98 \pm 2.58		1.28 \pm 1.98	
Employment status						
Employed	4.17 \pm 4.11	0.043	2.40 \pm 2.89	0.637	1.67 \pm 2.23	0.012
Unemployed	3.26 \pm 3.76		2.42 \pm 2.96		1.13 \pm 1.88	
Family history of cancer						
Yes	1.67 \pm 2.23	0.047	1.67 \pm 2.23	0.008	1.67 \pm 2.23	0.007
No	1.13 \pm 1.88		1.13 \pm 1.88		1.13 \pm 1.88	

SD = standard deviation. *Using Kruskal-Wallis and Mann-Whitney-U tests. [†]Did not complete secondary school.

have also shown an inverse relationship between age and psychological outcomes.¹⁶

Having a family history of cancer is associated with a significant psychological impact for screening for any type of cancer.¹⁷ In the current study, all three PCQ domains were significantly influenced in the participants who reported a history of familial cancer. Similarly, Taylor *et al.* found a positive correlation between the perceived risk and a family history of cancer in men screened for prostate carcinoma and that these men had a particularly high level of psychological distress.¹⁷ In a study by Fujiwara *et al.*, the level of education of participants with serious psychological distress significantly increased their willingness to participate in cancer screening.¹⁶ However, in the current study, education level of the participants had no significant effect on the PCQ results.

Conclusion

The current study found that the waiting time between the day of referral and the day of the mammography screening had only minimal impact on the social, emotional and physical well-being of the participants. Further research is required in this field and future studies should include patients undergoing other screening tests.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

FUNDING

No funding was received for this study.

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