

Original Article



Psychological effects of recall after mammography: A cohort study based on the HADS questionnaire

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Abstract

Introduction: This study assessed anxiety and depression scores based on the Hospital Anxiety and Depression Scale (HADS) questionnaire, inpatients recalled after mammography.

Methods: In this cohort study, women referred for mammography completed the HADS questionnaire. In 2019, 84 patients who required recall based on the results of their previous mammogram were selected and then completed the HADS questionnaire for the second stage. The HADS questionnaire was used to examine psychological problems. SPSS was used to analyze the collected data.

Results: In this study, 86 women who were screened with mammography were evaluated. The mean age was 47.2 ± 8.3 years. Based on the HADS questionnaire, the mean anxiety score before mammography was 10.2 ± 4.8 , and after the recall was 13.2 ± 4.2 , which was statistically significant ($P < 0.001$). Also, the depression score in these patients before mammography was 10.7 ± 3.8 , and after the recall was 12.6 ± 3.6 ($P < 0.001$).

Conclusion: Recalling patients after mammography can increase their anxiety and depression, which can decrease patients' desire for follow-ups.

Introduction

Breast cancer is the most common type among Iranian women and is only diagnosed when it reaches the advanced stages of the disease in 70% of cases. In 50% of cases, the evaluated diameter is more than 5 cm when detected.^{1,2} The prevalence of breast cancer is increasing in many countries. Patients with breast cancer experience a diminished quality of life due to physical and psychological problems.³ Imaging studies are widely used to diagnose breast diseases.⁴ According to mammography results, further treatment decisions are most often made for the patients. But sometimes, mammography must be recalled within a certain period after the initial mammography; this may be needed in 10% to 15% of patients.^{5,6} Many credible studies have documented anxiety, stress, and depression in women who go to radiology centers for mammography.⁷ In mammography of American women over 40, there are about one million false positive cases per year, potentially causing many concerns at the time of recall.⁸ Adverse psychological effects were significantly higher in these patients.⁹ These complications are usually transient and last for less than a month. However, concerns about breast cancer persist for a longer time.

Another study confirmed the association between receiving false-positive mammography results, which required patient re-evaluation, depression, insomnia, impaired physical and social functions, and other similar behavioral changes.¹⁰

There are several methods for measuring anxiety and depression. Among these effective measurement tools for clinical and research purposes, the method of Hospital Anxiety and Depression Scale (HADS) can be named. This method can be widely used in different parts of the hospital outpatient clinics.¹¹ The Iranian version of HADS is reliable in measuring psychological distress among cancer patients.¹² In this article, we used the HADS questionnaire to investigate the psychological dimensions of recall regarding breast cancer in Iranian patients.

Methods

Participants

The present Cohort study was performed on patients referred to a tertiary medical-educational center. The center was the referral center for obstetrics and gynecology in northwestern Iran. Simple random sampling was used to select the patients, utilizing the random

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numbers method. Inclusion criteria included having mammography performed during 2019 and being recalled for further evaluation. Exclusion criteria consisted of patients with proven and documented mental disabilities and unwillingness to be a part of the study. A total of 200 patients — Yamane's formula — were followed, of which 84 were called for more diagnostic evaluations; 116 (58%) patients were excluded from the study.

HADS Questionnaires

Eighty-four patients undergoing further medical examinations filled out the Persian versions of HADS — a total subscale score of >8 points out of a possible 21 denotes considerable symptoms of anxiety or depression. They were instructed by a certified nurse who was previously educated in this regard. The questionnaire was completed in a calm room specially dedicated to this purpose. The certified nurse also added further medical information regarding the patient's condition. According to the patients, 30.2% of their educational level was less than high school; thus, the information was provided in a very simple language, and the educated nurse completed the questionnaires.

Ethical considerations

The present study was approved by the local ethics board of the medical educational center in which it was performed (approval number: 58295- 5/2018). The study complied with the latest format of the Helsinki Declaration.¹³ All patients included in the study signed the written informed consent.

Statistical analysis

Statistical analysis was performed using the SPSS software pack. The normality of the data was assessed using the Kolmogorov–Smirnov test. Paired *t* test was used to compare the results before and after the mammography examination; note that the HADS questionnaire is pre-accredited, and thus there was no need to re-examine each variable. Repeated Measurement ANOVA was utilized to assess if there was a relation between demographic factors and HADS outcomes. The sample size was determined using the R statistical software using Yamane's formula.

Results

Eighty-four patients — 42% of the primary were followed as participants while 58% were considered non-participants — were included in the study. The mean age was 43.2 ± 8.3 years. Of the patients, 84 were married, and 2 were single. The number of children of the patients varied from none to seven; 65.7% of participants had two or three children. Of all the patients, 67 were homemakers, and the rest were employed. Thirty-six patients (30.2%) had not graduated high school, 27 had a graduation diploma, and 23 had a higher education degree. Only 6 patients (7.1%) reported a history of past mental illness, of which none

were currently under treatment, and none of them had a record of a major disorder, such as major depressive disorder, schizophrenia, or any other kind. Twenty-one patients had a history of breast cancer in their relatives, and 26 reported palpating a lump either by themselves or a medical doctor.

The relation between anxiety and depression scores and family history, education, Breast Imaging, Reporting, and Data System (BIRADS) score, and the feeling of a lump in the breast; no significant difference exists between any of the factors and the assessed score of depression and anxiety. However, the recall process is significantly associated with more anxiety and depression (Tables 1 and 2).

Discussion

Screening for cancers can lead to the early detection of malignancy, reduced mortality, and increased quality of life¹⁴; screening can also have detrimental effects, including psychological distress.¹⁵ Although many mammography results are negative or indicate benign breast diseases, many international studies have proven anxiety, worry, and depression in women who go to radiology centers for mammography, which could be annoying and cause less engagement in further medical screening. Current estimates indicate that there are about one million false positives annually in American women over 40 years of age, which can cause anxiety, stress, depression, and mental disorders when recalled.^{15,16}

As expected, Schou Bredal et al showed that anxiety and depression were lower in those who did not have a positive finding. In the patients who eventually had a confirmed cancer diagnosis, anxiety and depression were significantly higher than in the general population.¹⁷ Among those with no cancer, 24.3% and 4.3% were anxious and depressed, respectively; their prevalence decreased to 7.3% and 1.8% after 4 weeks. Of those with cancer, 28% had anxiety, and 4.8% had depression, reaching 24% and 12% after 4 weeks.¹⁸ In the study of Tyndel et al, 1286 patients with breast mass were studied, and the rate of psychological problems was significantly higher in those who were recalled than in the other patients.¹⁹ A study by Ong et al. reported that 29%-63% had psychological problems based on recall time.²⁰ In consistent with similar studies, our study showed that patient's anxiety and depression increased significantly after the call.^{21,22} On the other hand, Brett et al indicated that many women with a family history of breast cancer did not experience high anxiety levels in screenings.²³ Our results displayed no association between a family history of breast cancer and anxiety and depression.

Another contributing factor to anxiety and depression is the age of patients; several studies have shown that anxiety increases with age at the time of recall, and older women have more anxiety than younger women.²⁰ However, some studies have evaluated the impact of mammography

Table 1. Anxiety and depression scores, before and after recall, regarding family history and education

	With no family history of breast malignancy	With a family history of breast cancer	P value	Dropped out of high school	Completed high school	University degree	P value
Anxiety score before mammography	9.9±4.9	11±4.3		7.9±4.6	10.3±4.7	10.1±4.8	
Anxiety score after mammography	13.2±4	13.5±4.8	0.466	13.1±3.8	12.6±4.6	14.1±4.2	0.544
P value	0.001	0.001		<0.001	0.004	<0.001	
Depression score before mammography	10.4±3.4	11.6±4.7		10.4±3.7	4±10.5	3.8±10.7	
Depression score after mammography	12.4±3.2	13.1±4.7	0.458	12.8±3	11.4±4.4	13.7±3.2	0.544
P value	0.001	0.004		<0.001	0.014	<0.001	

Table 2. Anxiety and depression scores before and after recall, regarding BI-RADS score and having a palpable mass in the breast

	With no palpable lesion	With one or more palpable masses	P value	Low risk based on BI-RADS	Medium risk based on BI-RADS	High risk based on BI-RADS	P value
Anxiety score before mammography	9.9±4.9	10.8±6.4		9.1±4.9	11.5±4.1	10.2±5.3	
Anxiety score after mammography	13.3±3.9	13.1±4.8	0.288	13.5±3.4	14.1±4	11.3±5.8	0.334
P value	0.001	0.024		0.001	0.008	0.478	
Depression score before mammography	10.5±3.6	11±4.1		10±3.2	10.8±4.3	11±3.7	
Depression score after mammography	12.6±3.3	12.5±4.3	0.319	12.6±3	12±4.3	12.4±3.6	0.936
P value	0.001	0.003		0.001	0.032	0.028	

BI-RADS, Breast Imaging Reporting and Data System.

screening to be more on the anxiety of younger women rather than older women.²⁴ Our study showed that age has a significant relationship with patients' anxiety scores after being recalled: the increase in anxiety after recalling older patients to mammography is less than that of younger participants.

Recent studies have shown that education and training can reduce anxiety in patients by providing accurate and relevant information on various aspects of breast diseases and mammography screening methods.^{24, 25} Similar studies have shown the impact of education on anxiety and depression in patients after the recall; they have noted that illiteracy and other social factors, such as poverty and life expectancy, can contribute to increased anxiety and depression in patients.²³ But the results regarding the increase of anxiety and depression between different educational groups were insignificant. Schou Bredal et al showed no association between educational factors, occupation, family history of breast cancer, and history of mass detection in breast self-examination with anxiety and depression after the recall.¹⁷

Women who had a definitive diagnosis after mammography using fine needle aspiration (FNA) or biopsy experienced less psychological burden than those who did not receive a specific outcome in their evaluation reports in the study by Brett et al.²⁶

Considering that psychological distress cannot be a barrier to screening adherence because of its low severity,¹⁴ radiology experts should also be trained to ensure the patient is positioned correctly and has standard views to reduce false positives. They are identifying the patients who suffer from psychological distress after screening

makes it possible to investigate the underlying causes. Patients' adherence to screening will also be enhanced until results are obtained.¹⁴ Radiologists, on the other hand, should carefully review previous patient records and the current mammography to reduce the number of unnecessary recalls. Given the importance of screening in the diagnosis of breast cancer and the possibility of avoidance of screening methods due to psychological stress on the patients, future studies are suggested to be conducted on patient education methods to reduce the level of anxiety and depression in patients. Note that most published studies evaluated their participants during or after the screening; in contrast, our participants were not primarily screened candidates; most were referred to the mammography clinic for diagnostic plans. So, the results of this study may differ from those of other studies.

Conclusion

Recall following a mammography examination seems to increase depression and anxiety scores regardless of the demographic characteristics of the patients, which can decrease patients' desire for follow-ups. This is important and should be considered in managing patients, as the actual risk may differ from the perceived risk for malignancy. The design of similar multicenter studies with more participants can provide a better understanding of this issue and help with a better screening approach.

Authors' Contribution

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Study Highlights

What is current knowledge?

- Recall after a mammography examination can cause a temporary surge of anxiety due to the uncertainty and anticipation of what the results may reveal. Additionally, it may lead to a slight increase in depression, possibly due to the fear of a potential diagnosis and the emotional toll of dealing with the process.

What is new here?

- Our results also supported the idea that women who are recalled for further investigation for breast screening experience significantly greater adverse psychological consequences compared to women who received a clear result after the initial basic mammogram.

Sadeh.

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Competing Interests

No competing interests are existent.

Consent for Publication

Was obtained from all of the patients being included in the study.

Data Availability Statement

All data and relevant material are available upon request.

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