

Anxiety and Pain Level Associated with Mammography and the Impact of the Preexistence of Knowledge

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Received August 09, 2020; Revised September 10, 2020; Accepted September 18, 2020

Abstract Background: Breast cancer is the most common type of cancer in women, after skin cancer. Early detection and treatment are recommended for reducing mortality and suffering. However, screening behaviors are often avoided for many reasons, such as anxiety and stress. Mammography screening is the main recommended test for the early detection of breast cancer. The objective of this study was to assess the knowledge, level of pain, and stress in women during the early screening of breast cancer with a mammogram. **Materials and methods:** This study has been approved by the Local Research Ethics Committee. The study was conducted at Hafr Elbatin Central Hospital in Saudi Arabi among 100 women. Data were collected via a structured interview questionnaire before and immediately after the mammography procedure. The questionnaire consisted of three parts: (1) sociodemographic data and knowledge about the mammogram examination, (2) pain scale, and (3) anxiety scale. Data were entered and analyzed using SPSS version 25. Results: **A total of 75% (n=75)** of the women reported moderate to severe pain during the mammogram examination. Up to 57% (n=57) of the women expressed severe anxiety about the mammogram procedure. Most of the women-85% (n=85)-were found to have poor knowledge related to mammograms and mammogram preparation. There was a strong correlation between pain before and during the mammogram procedure, P-Value (0.00001*) with Chi-squared (33.40) and a highly significant correlation between satisfactory and unsatisfactory knowledge in women's P-Value (0.00001*) with z test (6.57). A poor knowledge about breast cancer was detected in the overall studied women and those who had never undergone mammography, particularly knowledge related to the risk factors for breast cancer. The most important predictors of the barriers to mammography were incorrect beliefs about mammography and its procedures. **Conclusion:** Pain expectations can be approached in various ways to make the mammography experience much more tolerable for women, thereby encouraging them to attend and return for their scans. It was determined that women who had mammography had a moderate level of anxiety.

Keywords: mammography, breast cancer, pain, anxiety

Cite This Article: Faten Aldhafeeri, and Manal Tharwat Abozeed, "Anxiety and Pain Level Associated with Mammography and the Impact of the Preexistence of Knowledge." *Journal of Cancer Research and Treatment*, vol. 8, no. 2 (2020): 25-32. doi: 10.12691/jcrt-8-2-4.

1. Introduction

Breast cancer is the most common type of cancer in women, after skin cancer. Breast cancer is also the second leading cause of death from cancer in women, following lung cancer [1]. In previous studies conducted in the US, it was predicted that approximately one in every eight women will be diagnosed with breast cancer in their lives and that one in every 30 women will die from breast cancer [2,3]. As with many other types of cancer, when breast cancer is found at an early stage during a commonly used screening for lumps, when it is small and has not yet spread, there is an increase in survival and a decrease in mortality.

Illness is a source of stress, whatever one's age. Everyone who has a health problem experiences anxiety, which is a normal response to facing danger. Anyone who comes to a health care facility with a health problem may be anxious for many reasons, such as being in an unfamiliar environment, having to interact with strangers, having health care personnel speak using medical terminology, and seeking diagnosis and a cure [4].

Mammography remains the most successful widely performed standard breast cancer screening method in Japan and Western countries. In mammography, after the papillary glands are adequately stretched, the breast is compressed with a radiolucent paddle for fixation and a reduction in thickness. In examinees undergoing mammography, not only breast compression but also fixation with the neck being rotated or the shoulder being

flexed is necessary. These imaging techniques reduce X-ray exposure and ensure the image quality necessary for diagnosis [5].

Undergoing certain diagnostic procedures, such as mammography, may cause some people to think about serious results and increase their anxiety. It has been shown that women who had recently felt tense and nervous or who feared a breast cancer diagnosis had higher anxiety levels. Mammography is the most reliable method for diagnosing breast cancer. When used alone, its reliability is 90%; when used with a clinical examination, its reliability is 95%. It can be used to diagnose breast cancer at an early stage. The American Medical Center recommends that women with no symptoms have their first mammogram at the age of 40 (earlier if they have a positive family history for cancer) and that they have a mammogram once every one to two years (per the physician's recommendation) between the ages of 40 and 50, and then once a year after age 50 [6,7]. Factors associated with screening mammography use are multiple and complex.

The time from an abnormal screening mammogram to definitive diagnosis causes anxiety and distress for women which may last for months [8]. Lengthy delays in diagnosis have been reported. For those subsequently diagnosed with cancer, this initial period of distress may create difficulty in terms of trust and confidence in the health care system. For the remainder, it may deter further screening compliance. Although identified as a significant concern, few studies have assessed the anxiety associated with the process from screening to definitive diagnosis.

One of the key reasons for patients' anxiety is a lack of knowledge about the method and how it diagnoses illness. To prevent patients from worrying unnecessarily, it is essential to inform those patients about diagnostic procedures. Anxiety has been determined to be a common problem in all types of medical diagnosis, treatment, and care [9]. Although it is known that patients have the right to be informed about diagnostic procedures and treatment modalities, education is often ignored. It is important to inform patients to reduce their anxiety level and prevent them from developing negative defenses [10]. For this reason, when patients are prepared for special procedures like mammography, it is important to determine their anxiety level and influential factors.

Women's breast cancer screening practices are influenced by certain factors that may act as barriers. To promote screening, these factors must be studied further [11]. Breast cancer mammographic examination experiences greatly influence women's attitudes toward their future mammography appointments and, thus, their attendance. Numerous female patients complain of pain while going through their mammography examination. Several studies have been conducted to address pain as a limiting factor for mammography appointment participation. Scaf-Klomp et al. [12] report that 55% of the women participating in mammography screening procedures complain about pain.

Mammographic screening continues to provoke intense debate, with some authors arguing that mortality reductions are small and that the benefits are largely outweighed by so-called over-diagnosis [13]. However, even the strongest detractors agree that mammographic

screening reduces breast cancer mortality to some degree in those who attend. A comprehensive recent review has supported the continuation of the breast screening program in the UK. It has been suggested that uptake is the most important factor in determining the success of a screening program. In breast screening, overall participation rates are affected by a wide range of factors, including psychological and socio-economic factors [14]. Repeat participation has been studied less often than initial uptake but client experience is one of the factors affecting re-attendance.

The current study aims to:

This study aims to assess the pain and anxiety level in women undergoing mammogram investigation. This study also aims to investigate whether pre-existing knowledge about mammograms has an impact on pain and anxiety.

Hypothesis

H1: Assess the level of pain that women reported immediately before and following the procedure.

H2: Determine whether pain was the most stressful part of the process of obtaining a mammogram.

H3: Assess the anxiety level before the mammogram and the relation of mammogram knowledge.

2. Materials and Methods

2.1. Setting

This prospective study was conducted in the Central Hospital Clinic and Mammography Unit Hafr Elbatin.

2.2. Subjects

All women admitted to the study settings during the time of data collection (three months) from October 2019 to December 2019 were invited to participate in the study.

2.3. Data Collection Tools and Procedures

A- Study tools:

The following tools were used to collect data

Tool 1: A structured interview with the women, divided into three parts.

The first part included socio-demographic characteristics to be completed by the women. The eight items of this part were (1) age, (2) occupation, (3) educational level, (4) marital status, (5) number of children, (6) menstruation status, (7) number of prior mammogram(s), and (8) level of pain felt during mammography.

The second part included knowledge related to mammogram preparation (9).

The third part of the questionnaire was completed by the principal investigator after having reviewed the report of the mammograms. Three items were included: (10) breast composition, (11) presence of cysts and/or solid nodules, and (12) final assessment according to breast.

Tool 2: Level of pain was measured using an ordinal pain scale. There were five levels: no pain, slight pain, moderate pain, substantial pain, and severe pain that required cessation of compression. Breast composition

was classified as either “dense breast”, which includes extremely dense and heterogeneous dense breasts, or “non-dense breast”, which includes scattered fibro glandular densities and almost entirely fatty tissue.

Tool 3: Anxiety level scale (the questions in this scale ask women about their feelings and thoughts during the mammogram by requiring them to circle how often they felt or thought a certain way: 0=Never, 1=Almost Never, 2=Sometimes, 3=Fairly Often, and 4=Very Often).

2.4. Operational Design

The operational design included the preparatory phase, content validity, the pilot study, and fieldwork.

A. Preparatory phase:

This included a review of relevant studies and theoretical knowledge of various aspects of the study problem using textbooks, articles, medical websites, periodicals, and magazines concerned with the topic of breast cancer and mammogram. These were available in PubMed, Ovid, and Cochrane library.

B. Pilot study:

A pilot study was carried out to test the study tools' clarity, applicability, objectivity, and feasibility. To achieve this, the tools were tested on 10% of the participants.

2.5. Statistical Design

- The collected data were coded and analysed using the Statistical Package for Social Sciences (SPSS version 25).
- Tabulated frequencies and percentages were calculated.
- The level of significance selected for this study was $P\text{-value} \leq 0.05$.

3. Results

This [Table 1](#) shows that (42%) of studied women are aged between (45-54) and that (76%) of them are married, (46%) have a middle school education, and (81%) are non-working. The table also shows that most of the studied women have irregular menstruation; (39%) experience menstruation that lasts less than three days, while (42%) have a normal amount. Meanwhile, (79%) have five or six children and (86%) breastfeed for less than six months.

Table 1. Distribution of the Studied Women According to Their Sociodemographic Characteristics and Obstetrical and Breast-Feeding History

Sociodemographic data	No. (100)	%
Age		
25 to 44 Years	27	27%
45 to 54	42	42%
55 years or more	31	31%
Minimum	25.00	
Maximum	70.00	
Mean \pm SD	49.64 \pm 8.51years	
Marital status		
Married	76	76%
Divorced	12	12%
Widow	12	12%
Education		
Elementary School	20	20%
Middle School	46	46%
Technical school	20	20%
High School	11	11%
University	3	3%
Occupation		
Working	19	19%
Non-working	81	81%
Obstetrical and breastfeeding history		
Status of menstruation		
Regular	31	31%
Irregular	69	69%
Duration of menstruation (days)		
Less than 3 days	39	39%
3 to less than 6 days	37	37%
6 days and more	24	24%
Amount of menses		
Normal	42	42%
Low	24	24%
Heavy	34	34%
No of children		
1-2	7	7%
3-4	14	14%
5-6	79	79%
Duration of breastfeeding		
Less than 6 months	86	86%
6 months to less than 12 months	3	3%
12-18 month	1	1%
18-24 months	10	10%

Table 2. Distribution of the Studied Women According to Their Knowledge About the Mammogram Procedure

Women Knowledge related to Mammogram procedure	Incorrect answers		Correct answers		Doesn't Know	
	No.	%	No.	%	No.	%
Have you ever heard about a screening called mammography	42	42%	35	35%	23	23%
Mammography is a way to find out if there is a problem in the breasts or not	41	41%	25	25%	34	34%
Do you think with this examination, women can prevent breast cancer	32	32%	18	18%	50	50%
Is the examination only important for women over 50 years of age	24	24%	16	16%	60	60%
Is screening important only for women who have had breast cancer in the family?	27	27%	16	16%	57	57%
Do you think this is an important test to be conducted brigade experienced by the doctor or the woman herself	27	27%	14	14%	59	59%
Do you think that mammography puts a woman's breast in an x-ray machine, where the breast is compressed, then the doctor makes the picture	28	28%	13	13%	59	59%

This Table 2 shows participants' knowledge regarding mammogram.

Table 3. Total Knowledge Score and Association Between Women's Knowledge Regarding the Mammogram Procedure

Knowledge Score regarding Mammogram	NO (100)	%	Test of significance
Satisfactory	15	15%	Z: 6.57
Unsatisfactory	85	85%	P: 0.00000*

* Significance at P-value ≤ 0.05 , $P < 0.001$ HS.

Table 3 shows that most of the participants unsatisfactory knowledge regarding mammography.

Table 4 shows that (50%) of the participants had undergone a mammogram for the first time, (35%) had mild pain before the mammogram, (77%) have abnormal breast formation (i.e., (25%) have a mass while (61%) have a cyst or tumors), and (57%) had a positive breast evaluation.

This Table 5 shows that 38% and 37% of the participants experienced severe to moderate pain during mammography respectively.

This Table 6 shows that (19) of the studied women who had moderate pain ranged in age from 45-54 years; (24%) of women with severe pain during mammograms had a positive assessment.

Table 7 shows that (18%) of the women had moderate pain before and during mammograms.

Table 8 shows the anxiety levels among women.

Table 9 shows the correlation between the level of anxiety and sociodemographic data; (42%) of studied women between the ages of (45-54) are more anxious, while (46%) of the middle-school-educated women have an anxiety level of 50.22 ± 5.91 . Meanwhile, (81%) of non-working women have an anxiety level of 49.41 ± 5.54 , while (69%) of studied women have irregular menstruation and an anxiety level with mean and SD of 49.49 ± 6.38 .

Table 10 shows that (57%) of studied women with a positive assessment have an anxiety level of 49.47 and that (35%) of women have mild pain before mammogram with an anxiety scale mean of 49.21. Meanwhile, (85%) of women have unsatisfactory knowledge, with a mean SD of 49.50 ± 6.00 for the anxious condition.

Table 4. Distribution of the Studied Women According to Their Breast Examination Findings

Breast examination findings	No. (100)	%
number of prior Mammograms		
Once	50	50.0%
Twice	26	26.0%
Three times or more	24	24.0%
Pain level before the Mammogram procedure		
No pain	19	19%
Mild pain	35	35%
Moderate pain	29	29%
Severe pain	17	17%
Breast formation		
Normal breast	23	23%
Abnormal breast	77	77%
benign LN	5	5%
breast lump	3	3%
Cyst	3	3%
Moderately fibro glandular	10	10%
cystic lesion	17	17%
Mass	25	25%
intramammary LN	2	2%
RT mammary 13mm, 7mm lymphadenopathy	1	1%
microcalcification	2	2%
focal lesion	1	1%
Duct ectasia	2	2%
oval cyst	2	2%
microcalcification	3	3%
multiple cysts	1	1%
Presence of cysts or tumors		
No	39	39%
Yes	61	61%
Final breast evaluation		
Negative	43	43%
Positive	57	57%

Table 5. Distribution of the Studied Women According to Their Numeric Rating Scale of Pain During the Mammogram Procedure

Numeric rating scale of pain		No. (100)	%
No pain	No pain	0	0%
Mild Pain Levels	Pain Level 1 Very Mild	25	25%
	Pain Level 2 Discomforting		
	Pain Level 3 Tolerable		
Moderate Pain Levels	Pain Level 4 Distressing	37	37%
	Pain Level 5 Very Distressing		
	Pain Level 6 Intense Pain		
Severe Pain Levels	Pain Level 7 Very Intense Pain	38	38%
	Pain Level 8 Horrible Pain		
	Pain Level 9 Excruciating		
	Pain Level 10 Unimaginable Pain		

Table 6. Relation of Pain Level Scale and Age With the Final Assessment

Pain Level Scale		Age Groups			Chi-squared	P-Value
		25 to 44 years	45 to 54 years	55 years or more		
Pain Level Scale	Mild	5	8	12	5.84	0.21164
	Moderate	9	19	9		
	Severe	13	15	10		
Pain Level Scale		Final assessment		Chi-squared	P-Value	
		Negative	Positive			
Pain Level Scale	Mild	12	13	0.97	0.61449	
	Moderate	17	20			
	Severe	14	24			

Table 7. Relation of Pain Level Before and the Pain Level Scale During Mammogram

Pain Level scale		Pain level Before the mammogram				Chi-squared	P-Value
		No pain	Mild	Moderate	Sever		
Pain Level scale	Mild	6	13	5	1	33.40	0.00001*
	Moderate	2	15	18	2		
	Sever	11	7	6	14		

P < 0.001 HT.

Table 8. Distribution of the Studied Women According to Their Anxiety Level Assessment Scale

Anxiety Level Assessment Scale	Level of women's anxiety (n.100)										Level of women's anxiety (n.100)	
	Never anxious		Rarely anxious		Sometimes anxious		Fairly Often anxious		Very Often anxious		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%	Anxiety level	NO
1-In the last month, how often have you been upset because of something that happened unexpectedly?	8	8.0%	38	38%	28	28%	22	22%	4	4%	Slightly Anxious	43
2-In the last month, how often have you felt that you were unable to control the important things in your life?	7	7%	36	36%	31	31%	23	23%	3	3%		
3-In the last month, how often have you felt nervous and "Anxiety"?	6	6%	31	31%	28	28%	26	26%	9	9%	Very Anxious	57
4-In the last month, how often have you felt confident about your ability to handle your problems?	8	8%	32	32%	32	32%	24	24%	4	4%	num Mini	40
5-In the last month, how often have you felt that things were going your way?	7	7%	33	33%	33	33%	23	23%	4	4%	Maximum	72.5
6-In the last month, how often have you found that you could not cope with all the things that you had to do?	5	5%	30	30%	35	35%	23	23%	7	7%	Mean± SD	49.55±5.86
7-In the last month, how often have you been able to control irritations in your life?	5	5%	33	33%	34	34%	22	22%	6	6%		
8-In the last month, how often have you felt that you were on top of things?	7	7%	33	33%	38	38%	16	16%	6	6%		
9-In the last month, how often have you been angered because of things that were outside of your control?	5	5%	33	33%	36	36%	21	21%	5	5%		
10-In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?	8	8%	32	32%	35	35%	21	21%	4	4%		

Table 9. Correlation Between Anxiety Level Assessment Scale and Sociodemographic Data

Sociodemographic data		Anxiety level mean percent ± SD	Test of significance	
Age			F	P-Value
25 to 44 Years	27	49.17± 5.19	F:0.34	P: 0.71478 P > 0.05 NS
45 to 54	42	50.12 ± 6.00		
55 years or more	31	49.11± 6.34		
Education			F	P
Elementary School	20	48.38±4.00	1.62	0.18914
Middle school	46	50.22±5.91		
Technical school	20	50.88±7.40		
High school or university	14	47.14±4.99		
Occupation			T	P
Working	19	50.13±7.24	0.48	0.63341
Non-working	81	49.41±5.54		
Obstetrical history			t	P
Status of menstruation.		mean percent ± SD		
Regular	31	49.68±4.60	0.15	0.88508
Irregular	69	49.49±6.38		

P-value of ANOVA test F: ANOVA test, * Significance at P-value ≤0.05.

Table 10. Relation of the Final Assessment and Pain Level Before Mammogram and Women's Knowledge with the Anxiety Scale

Variables		Anxiety scale			t	P-Value
		N	Mean	SD		
final assessment	Negative	43	49.65	6.74	0.15	0.88179
	Positive	57	49.47	5.17		
pain level before mammo		N	Mean	SD	F	P-Value
	No pain	19	49.47	4.45	0.27	0.84965
	Mild	35	49.21	5.48		
	Moderate	29	50.34	6.97		
	Sever	17	48.97	6.32		
Knowledge level		N	Mean	SD	t	P-Value
	Satisfactory	15	49.83	5.22	0.20	0.84036
	Unsatisfactory	85	49.50	6.00		

P > 0.05 NS.

4. Discussion

Mammography is an ideal method of providing regular screening for the early diagnosis of breast cancer. The most effective way to decrease mortality from breast cancer is through early diagnosis. Mammography is not the most successful imaging technique for the early diagnosis of breast cancer but it is cheap, easy to perform, and readily available [6].

The current study was conducted to assess the pain and anxiety levels in women who were undergoing a mammogram. It also aimed to investigate whether pre-existing knowledge about mammograms has an impact on pain and anxiety. We showed low knowledge about the mammogram procedure and moderate to severe pain before and during the mammogram, with over half of the studied women being very anxious.

This study showed that less than half of the studied women in age between 45 to 54 years. Most of them were married, while less than half of the middle school education. Most of the studied women were non-working. In terms of obstetric history, over half had irregular menstruation, while less than half had the normal amount. Finally, most of them breastfeed for less than six months. These results align with those of [15], who reported on clinical scientific evidence about mammographic screening benefits in the age group from 40 to 49 years. However, there is evidence that the balance between possible benefits and damages is more unfavorable in the age group from 50 to 69 years.

The deficient knowledge among the studied women may stem from the fact that most of them have a middle school education. Moreover, regarding the women's knowledge in the present study, most of them had unsatisfactory knowledge about mammogram procedures and this is expected because of their level of education. There was a highly significant difference between satisfactory and unsatisfactory (0.00001*) knowledge. These results align with those of Güçlü S et al. [16], who reported that the most significant barriers to obtaining screening mammography were a lack of information about breast cancer and a low level of education in 99.2% of women. This study contradicts AL Mutlaq et al. [17], who reported that, in terms of an individual's knowledge about mammogram procedures, the majority of the study subjects were found to have good knowledge. The current study showed that barriers against the implementation of

mammogram procedures in women were related to a lack of knowledge about these methods. Level of education and lack of adequate information about mammogram screening, as well as symptoms of breast cancer, may result in late diagnosis. Health care providers play a key role in increasing breast cancer early detection rates through early diagnosis with mammogram screens.

In over 77% of the studied women, the screening mammograms detected abnormal breast findings. Half of the women were undergoing a mammogram procedure for the first time, while less than half had mild pain before the procedure. Also, over half had a cyst and positive final breast assessment. These findings were similar to Liberman and Menell [18], who reported that the ratio between benign lesions and malignant neoplasms in surgical biopsies of palpable lesions was over three times greater than the internationally adopted pattern (≤ 2). This indicator, together with the positive predictive value, seems to suggest the existence of an excessively elevated number of false-positive results in the screening.

Pain expectation can be approached in various ways to make the mammography experience much more tolerable for women and to encourage them to attend their scans. One method could be the psychological approach, to be carried out by the screening staff. Time can be taken to speak to the patient, informing her fully and correctly about the procedure while addressing any of her questions and concerns [11].

In our study, 35% of the women expected to experience mild to moderate pain before going in for the scan. Post-mammography, 38% of the women reported experiencing severe pain. There was a highly significant difference in the mean scores for pain before and after the mammogram ($p < 0.005$). If women continue to face pain during their mammography scans, this result was in the same line as that of Keemers et al [19]. Who reported that pain is associated with mammogram examinations and hence some of the participants to abstain from the examination?

The presence of pain during mammogram examination might reduce women's likelihood of attending their upcoming exams. To boost the chances that women will return for a future mammography examination and to optimize the procedure experience itself, it is of great benefit to minimize pain risks. Previous breast procedures also had a significant impact on women's pain perception of mammography. To obtain adequate images of the

breast tissue of women who have been diagnosed with breast cancer and who have undergone procedures, repeated increased compression studies are required. Ongoing breast pain in breast cancer survivors can influence more mammography-related pain, and 88% experienced pain [20].

The time from an abnormal screening to definitive diagnosis causes anxiety and distress for women which may last for months. For those subsequently diagnosed with cancer, this initial period of distress may create difficulty with trust and confidence in the health care system; for the remainder, it may deter further screening compliance [21].

In this study, over half of the studied women experienced severe anxiety during the mammogram procedure, with mean \pm SD 49.55 \pm 5.86. The inclusion of both qualitative methods in analyzing focus group data and quantitative methods in analyzing data revealed differences in the interpretation of women's experiences and satisfaction with the diagnostic process. Responses to the survey questionnaire indicated easily accessible and reasonably clear information about the diagnostic process and high satisfaction. This result aligns with that of Brunton et al. [22] who reported that the level of anxiety about mammography screening was found to be higher in women with low education levels.

As the number of mammograms done increased, the anxiety level increased. This difference was found to be statistically significant. The reason for this may stem from the notion that, because the physicians recommended that women have regular mammography screenings, the women thought there was a suspicion of cancer [22,23].

From the results of this study, it has been determined that women undergoing mammography have a moderate level of anxiety. Statistically, no significant differences were found for age, education level, occupation, obstetrical history, information resources, knowledge about the illnesses that mammography detects, and number of mammograms.

One of the important reasons for women's anxiety is a lack of knowledge about the method and how it diagnoses the illness. [24], pointed out that it is necessary to inform women about diagnostic procedures to prevent women from worrying unnecessarily. Anxiety has been determined to be a common problem in all kinds of medical diagnosis and treatment. Although it is known that women have the right to be informed about diagnostic procedures, education is often ignored. It is important to provide information to women so as to reduce their anxiety and prevent them from developing negative defenses. For this reason, when women are prepared for special procedures like mammography, it is important to determine their anxiety level and influential factors.

This study showed a strong relationship between anxiety and final assessment and positive cases, with 49.47 \pm 5.17. This result aligns with that of Hafslund [25]. The literature has reported that women feel anxious about mammography due to a fear of cancer and the pain experienced during the procedure. Women are not willing to undergo mammography again because they experienced pain and anxiety during their first mammogram. The present study showed that less than half of studied women

had mild pain before mammogram, with a mean of \pm 5.48, and were severely anxious. Most of the women noted that they would have a mammogram again, while the rest did not want to have a mammogram due to pain. The women were allowed to control the compression of their breasts during mammography and felt moderate pain. It has been emphasized that self-control over a painful procedure helps women adapt to pain more easily and feel less pain.

A painful experience during a mammography exam is of special importance and should be further considered, as a mammogram is an essential element of the success of early breast cancer prevention campaigns. There was no statistically significant relationship between the anxiety and pain levels before the mammogram. This result aligns with that of Mandelblatt and Yabroff [6] who reported no statistically significant relationship between anxiety and pain levels.

This study showed no significant relationship between anxiety and women's knowledge (49.50 \pm 6.00), although most of the studied women had unsatisfactory knowledge. The current study showed that barriers to the implementation of breast cancer screening methods in women were related to a lack of knowledge about these methods. This result is the same as that of Smith et al. [2], who reported that the most important barriers to obtaining screening mammography were a lack of information about breast cancer and a low level of education. They also stated that a lack of knowledge about breast cancer was the main reason why women did not obtain mammograms. It can be concluded that women feel anxiety and severe pain concerning mammography and that unsatisfactory knowledge about mammography may contribute to their feelings. It might be useful to conduct educational sessions for each woman who is supposed to undergo mammogram examination.

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