

## Assessing the Effectiveness of Distraction Techniques on Alleviating Pain and Anxiety in Women Undergoing Screening Mammography

Sanaa Ghareeb Ahmed Ebrahim<sup>1</sup>, Esraa Mostafa Abd El-Aty Ibrahim<sup>2</sup>, Azhar Abdel-Fatah Mohamed Shehata<sup>3</sup>, Nor El-Hoda Mohamed El-Sayed El-Shabory<sup>4</sup>

<sup>1</sup>Lecturer at obstetric and gynecological nursing, Faculty of Nursing, Ain Shams University, Egypt.

<sup>2&4</sup> Assistant professor of Maternity, Gynecology and Obstetrics Nursing, Faculty of Nursing, Port-Said University, Egypt.

<sup>3</sup>Assistant Professor of Community Health Nursing, Faculty of Nursing, Zagazig University, Egypt.

### Abstract:

**Background:** Mammography is the most useful test for detecting the growth of breast tumors. Regular screening mammograms for women can reduce the death rate from breast tumor progression. **Aim:** Assess the effectiveness of distraction techniques on alleviating pain and anxiety in women undergoing screening mammography. **Subjects and method:** **Design:** A prospective, randomized controlled trial research design was used. **Setting:** The study was conducted in Al-Iman Center at Al-Tadamon Hospital in Port Said city. **Subjects:** One hundred women were randomly assigned to two equal groups as part of a purposive sample. **Tools of the study:** Three instruments were employed to collect data for the purpose of research. Structured interviews, The Hospital Anxiety and Depression Scale (HADS), and The numerical pain rating scale (NRS). **Results:** Having a painful examination and being afraid of radiation are the biggest obstacles to mammography. In terms of pain, the results showed that the distraction group's mean pain score decreased to  $2.82 \pm 2.037$  as compared to  $5.22 \pm 1.788$  in the control group, with a significant difference between the two groups ( $p=0.00$ ). Furthermore, a drop in the distraction group's mean anxiety score was noted in comparison to the control group ( $7.12 \pm 4.397$  &  $7.88 \pm 4.059$ , respectively), with no statistically significant differences between the two groups ( $p=0.37$ ). **Conclusion:** Distraction techniques are a useful and recommended technique to help women cope with their discomfort and anxiety during breast tumor screening mammograms. **Recommendation:** It is recommended that this should include into formal work protocols, procedural guidelines, training curricula, and performance evaluation standards for radiographers.

**Keywords:** Anxiety, Distraction Technique, Mammography, Pain.

### Introduction

Breast cancer (BC) has an essential negative influence on women's health everywhere, including Egypt. With 2.3 million new cases (or 11.7% of all cancer cases) in 2020, it is regarded as the primary cause of cancer and the fifth most common cause of cancer-related death globally, accounting for 685,000 fatalities. In Egypt, it accounts for 32.4% of instances of cancer in females, and about 22,000 new cases are detected annually (Moaz et al, 2023).

Changes to the skin or nipple, as well as a lump or thickening of the breast, comprise the

symptoms. In addition to lifestyle variables like alcohol consumption, genetic risk factors can also increase the likelihood of the event. There are several treatment options available, such as chemotherapy, radiation therapy, and surgery. Two crucial strategies for lowering the risk are being aware of the symptoms and the necessity of screening (Mishra et al, 2023).

Significant socioeconomic, psychological, and public health consequences result from the cancer. Over a million new cases of BC are thought to be diagnosed each year. Although the incidence of breast cancer in Arab women has increased over the past 24 years, people are still receiving diagnoses at later

stages of the illness. Effective reduction of morbidity and mortality has been demonstrated by early diagnosis of BC through screening initiatives. Reducing the risk can be achieved in part by being aware of the symptoms and the importance of screening. Early diagnosis and improved chances of therapy and recovery are ensured by mammography (**Mishra et al, 2023**). The Centers for Disease Control and Prevention advise women aged 50–74 to undergo mammography for breast cancer screening at least every two years, and those aged 40–49 to decide whether to undergo screening on their own (**Woloshin et al, 2023**).

A screening mammography is a non-symptomatic breast x-ray examination. A screening mammography is intended to detect cancer when it is still too small for a patient or her physician to feel. A screening mammography significantly increases a woman's chances of receiving a successful course of treatment for minor breast cancers (**Fatima et al., 2018**). Digital mammography is one of the most recent developments in x-ray mammography. Similar to traditional mammography, digital (computerized) mammography creates detailed images of the breast using x-rays. It employs roughly the same mammography apparatus as traditional mammography, but instead of a film cassette, the apparatus is outfitted with a digital receptor and a computer. Digital mammography is at least as accurate as traditional mammography, according to a number of studies (**Shi et al., 2023**).

According to the US Food and Drug Administration, mammography can detect up to two years before a breast cancer diagnosis develops and can identify 85–90% of breast cancer malignancies in women over 50 (**Lee et al, 2023**). The most common illnesses affecting women is breast tumors. Women between the ages of 40 and 69 who have general mammography screening can reduce their risk of breast cancer growth death by 40–45% (**Gutiérrez et al., 2023**). Moreover, a few studies have reported that among invited women aged 50–70, mammography screening reduces breast cancer mortality by 20%. Utilizing discovery programming, computerized mammography can highlight suspicious breast

lesions that were not first noticed by a radiologist (**Liu et al., 2023**).

A mammography compresses the breast between two transparent plates. In order to decrease breast tissue thickness, the breast must be compressed. This is done in order to minimize the number of tissue layers that the X-ray beam must pass through. In the process, radiation absorption is reduced and the highest-quality image is generated (**Shi et al., 2023**). However, the examinee typically experiences pain during breast compression and immobility during mammography. Furthermore, in order to acquire the best possible X-ray images, the radiological technologist frequently controls the breast directly and stretches it out. As a result, mammography results in both physical and emotional hardship (**Lee et al, 2017**).

Pain is considered to be the primary barrier to women's mammography. Breast compression is an essential procedure for mammography in order to lower radiation exposure and enhance image quality. The majority of women report feeling pain during the compression process. Pre-mammography breast sensitivity, a family history of breast cancer, a high level of education, medical staff negligence during mammograms, and prior mammography-related pain experience all contribute to an increased level of discomfort during the procedure (**CELIK et al., 2021**).

The existence of pain expectancy is thought to be a potent cause of anxiety that can alter the pain threshold, in addition to the numerous other factors that can influence the pain experienced during mammography. According to a study, women who reported significant levels of anxiety also reported experiencing high levels of mammography-related pain (**von Brandis, 2023**). Interventions aimed at lessening both physical and psychological discomfort are required since anxiety is known to be the primary cause of procedure pain (**Feito et al 2015**).

According to recent research, a similar distraction technique can have a favorable influence on people by reducing stress hormones, altering cognitive processes, and improving mental health and social ties.

Additionally, a communication diversion approach that promotes positive mental effects like relaxation and joy is anticipated. The correspondence distraction approach might have positive effects on reducing the suffering associated with mammography. Accordingly, the purpose of this study was to determine how the correspondence distraction technique affected the reduction of distress in mammography (Aloisi, 2023).

Distraction is the procedure of distracting your focus. It does not imply that the suffering has subsided. It simply means that you shift your attention to something else by using your brain. You can set your pain aside and use your attention to count, play games, do breathing exercises, and a host of other things. Using distraction is one strategy you might employ to reduce the amount of time you spend fearing or worrying about pain (Hagmann et al., 2023).

Additionally, make sure your surroundings are well-stocked with distractions, including entertaining books, artwork or posters, or music. Additionally helpful in reducing mammography pain are videotaped materials. On a video cassette, women who have undergone the surgery for the first time will be interviewed. Common worries and fears, along with obstacles to pain management control, may be discussed (Devlin, et al., 2023).

Furthermore, Distraction methods have also been effectively applied to the treatment of a wide range of medical and psychological conditions. Distraction strategies have been shown in multiple trials to be effective in lowering pain and anxiety during mammography screening procedures. In order to lessen related discomfort and increase adherence to annual mammography screening for the early diagnosis of this deadly disease, this research aims to enhance our awareness of the mammography experience. Health practitioners should thus take a leading role in determining and attempting to remove the things that prevent women from getting mammograms as well as offering them comfort and support when they get one (Hagmann et al., 2023).

## Significance of the study

Among women globally, malignant lesions most frequently result from breast cancer. According to Monterola, Alcaraz, and Galvez-Sánchez (2023), mammography screening has been shown in a few studies to reduce the death rate from breast cancer by 23%. Utilizing discovery programming, computerized mammography can highlight problematic breast tumors that were not first noticed by a radiologist (Saggi et al, 2015). Fear is one psychological element that may affect how much people participate in screening programs, which ultimately determines whether or not it might be prevented. Over 22,000 newly diagnosed cases are reported with cancer each year in Egypt, where it accounts for 32.4% of all female cancer cases (Moaz et al., 2023).

A third to half of women do not adhere to screening recommendations, within a Miller et al. (2023). The anxiety and pain related to mammography is one of a significant often mentioned causes of this refusal. The majority of women who decide not to rescreen do so primarily due to discomfort experienced throughout the process. Anxiety is known to be the primary cause of procedural pain, hence it is necessary to implement therapies that lessen both psychological and physical suffering. Despite the fact that both women and researchers have long recognized the discomfort that comes with mammography, no intervention trials studies involving mammography patients have been published as of yet. Therefore, this study was conducted to assess the effectiveness of distraction techniques on alleviating pain and anxiety in women undergoing screening mammography.

## Aim of study:

Assess the effectiveness of distraction techniques on alleviating pain and anxiety in women undergoing screening mammography.

### Specific Objectives

- Assessing the pain level among women in the two groups after screening mammography.

- Assessing the level of anxiety among women in the two groups after screening mammography.

- Identifying the effect of distraction technique on reducing pain and anxiety level during screening mammography among distraction groups.

### Research hypothesis:

During screening mammography women who receive the distraction technique exhibit lower levels of pain and anxiety than those who do not receive it.

### Subject and methods

#### Research design:

For this research, a prospective, randomized controlled trial research approach was adopted. The time frame for conducting it was September 2022 to May 2023.

#### Settings:

The study was conducted Al-Iman Center at Al-Tadamon Hospital in Port Said city from September 2022 to May 2023. Because there were no other governmental places for screening mammograms in Port Said city.

**Sample:** Using an online sample size calculator, **Azim et al. (2023)** reported that the expected frequencies (p) were 42%, with a confidence level of 85% and an error of 5%. The study employed a purposive sample approach, with 100 women per two group who provided informed consent and were physically present in the indicated location for data collection.

#### Inclusion criteria:

(1) Ages Age  $\geq$  40 years.

#### Exclusion criteria:

(1) women who took pain or anxiety medication prior to mammography; (2) Breast surgery patients; and (3) women with depression

**Tools of data collection: three tools will be used to this study**

### 1- Structured interviews included three parts

1.Participant demographic general information, including age, marital status, degree of education, place of residence, kind of work, number of years worked, and hours worked.

2.Obstetrical history

3.Family history

### 2- Anxiety and Depression Scale (HADS)

**Zigmond and Snaith (1983)** developed the English version of the Hospital Anxiety and Depression Scale (HADS), a self-assessment tool, to identify emotional discomfort, anxiety, and depressive states in patients receiving treatment for a range of clinical issues. Eight questions on depression and eight questions on anxiety made up the original version of the measure. 14 items total, divided between the anxiety and depression subscales, make up the self-directed HADS scale. Responses are graded on a range of 0 to 3, with 3 denoting higher symptom frequencies. Each subscale (depression and anxiety) has a score between 0 and 21, which are then divided into four categories: normal (0–7), mild (8–10), moderate (11–14), and severe (15–21). Higher scores indicate more discomfort. The total emotional distress scale has a range of 0 to 42. Patients encouraged to "fill it completely in order to reflect how they have been feeling during the past week" before finishing the scale.

### 3-The numerical torment rating scale (NRS)

In English format, it was adopted from Johannessen (2019) to evaluate pain level It is crucial to understand that this is an 11-point scale, not a 1–10. Find out if the woman is experiencing pain right now by asking. If that's the case, ask them to describe the inconvenience.

- To find out how well they understand the scale, ask them if they would notice :

- To find out if they comprehend the scale, ask if they can identify: Zero claim of having no pain ("0") (or specific discomfort

they express). And the worst pain (or specific discomfort) imaginable ten ("10").

- This technique can be repeated with similar questions regarding passionate difficulties.

- Have the lady rate the force of their pain / inconvenience "at the present time" vocally with a number or by indicating the number that corresponds to their pain strength.

**Content and Face validity:** In order to determine whether the changed tools are suitable for the intended purpose, content and face validity were examined. Seven professors from the medical and nursing faculty who specialize in obstetrics, gynecology, and psychiatry evaluated the content's face and validity.

**Test reliability:** An Alpha Cronbach reliability test was performed on the research instrument. Cronbach's Alpha test revealed that the internal consistency of the instruments was sufficient. The reliability of the numerical torment rating scale was 0.96, the reliability of the anxiety and depression scale was 0.77, and the reliability of structured interviews was 0.917.

### **Ethical approval:**

The ethical committee of Port Said University's nursing faculty granted formal permission and approvals to conduct this study under code NUR /11/2023 (31); additionally, the head manager of the previously mentioned sitting approved the study after obtaining the required approvals and choosing the (radiology department) in the previously mentioned sitting. All women in the study's sample were informed that they had the option to participate or not. The researcher gave an explanation of the study's purpose to each of the women in the study sample. They were told that all research information would be maintained private and utilized only to forward the goals of the investigation. The privacy of the subjects was always respected. Before being enrolled, the women signed given written consents.

**Administrative Design:** In order to get authorization before performing the study, the directors of the previously stated sitting in the governorate of Port Said were granted official consent by the Dean of the Nursing Faculty and the Directorate of Health. They were assured that the data they submitted would only be utilized for research, and they were offered the choice to avoid participating.

**A Pilot study:** Ten women were used to assess the tool's validity and adjust the routine of the staff achievements department. No changes were found to be necessary.

**The filed work:** From September 2022 to May 2023, the data was collected. Strategy to Intervention was conducted in four main phases, including: preparation, assessment, implementation, and evaluation.

**Phase of preparation:** The researcher met with the manager of the department prior to the mammogram and conveyed the goal of the study. After reading through the relevant literature, the researcher employed the three data collection instruments and informed the participants that their participation was completely optional.

**Phase of assessment:** Following their change into gowns and waiting in the designated waiting area for screening mammography patients exclusively, women were questioned by a researcher during this phase. A brief study was designed to see whether distraction techniques could lower screening mammography pain and anxiety levels, and each potential patient was asked if she would be interested in taking part. Thirty minutes was the anticipated time commitment, and answer confidentiality was ensured.

Participants' consent was obtained before any data was collected, and each woman in the waiting area received an anxiety questionnaire. The study's objectives and the woman's rights to participate in research are described in full in the oral permission form. All participants were given the chance to read and discuss the material regarding the intervention method. The participant may choose not to take part in the study at any point throughout it.

**Phase of implementation:** Participants were randomly assigned, by bringing lots, to one of two groups: the group receiving interventions, or the group receiving distraction techniques. Carefully designed filmed materials could also be highly helpful in managing mammography pain. Women should have been given more precise sensory and procedural instructions prior to every stage in the mammography process.

A videotape Possibly comprise instructions, calming music, amusing drawings or posters depicting real flowers, and more The distraction group was given access to the room and was given a 20-minute videotape to view while interacting. Within the examining room, the CD system supplied the videotape. For twenty minutes, the control group acted as they pleased in the room and did not view a videotape. It is important to firmly encourage the women to report any pain they may feel during the mammography process.

**Phase of evaluation:** Following mammography, both groups completed an 11-point numeric rating scale (NRS) to gauge their level of pain, an anxiety and depression scale to gauge their level of anxiety, which they then wrote on their sheets.

**Data analysis:** Bar graphs are used to depict the data, and values are expressed as mean, standard deviation, frequency, and percentages. Using a reliability test, the internal consistency of the items measuring the same construct was ascertained using Cronbach's alpha coefficient. The statistical difference between the study groups was determined using the Student Independent Two Sample T-test. P less than 0.05 was regarded as significant in every analysis. SPSS statistical software, version 20, was used for all statistical analyses.

## Result

The percentage distribution of the analyzed samples' regarding their ages is displays in **Table 1**. The average age was  $50 \pm 5$  years, according to the table. There mean age were fifty for each of the two groups. In four age categories ranged from 45 to 69 age. In addition, it was noted that 60% and 56% of

them were in the 45–49 age range in the distraction and control groups. 16% of the control group and 20% of the distraction group were between the ages of 55 and 59.

The percentage distribution of the tested samples' educational attainment is shows in **Table 2**. In terms of educational attainment, this table shows that the research sample for both groups shows that 50% of the distraction group and 70% of the control group hold a university degree.

**Figure 1:** Shows the percentage distribution of the analyzed samples with respect to their occupation. This graph shows that 32% of the control group and 40% of the intervention group were working women, and 58% of the group in the control and 54% of the group in the intervention were housewives.

**Table 3:** Shows the percentage distribution of the analyzed samples with respect to the status of marriage. According to this table, 70% of the women in the control and distraction groups were married, whereas 16% of the women in the control group were single and 16% of the women in the distraction group were divorced.

**Table 4** presents the percentage distribution of the analyzed samples with respect to the income of their families. With respect to family income, it was discovered that 44% and 38% of the two groups (control and intervention) had monthly family incomes ranging from 6000 to 9 EGP.

**Figure 2:** displays their medical and surgical history procedures; Over two thirds of the samples that were evaluated (control and intervention group). According to the above graph, 66% of the distraction group and 70% of the control group have a history of surgery or medical conditions.

**Figure 3:** Shows that although 64% of the control group and 50% of the distraction group have irregular and absent menstrual histories, 36% of the control group and 50% of the distraction group have regular menstrual histories.

The number of pregnancies is shown in **Table 5**, where it was discovered that 34% and 52% of the control and distraction groups, respectively, had three or more categories of pregnancies. Additionally, it notes that 18% of the distraction group and 22% of the control group were not had pregnancies.

**Figure 4:** demonstrates that 74% of distraction and 84% of control groups do not have any gynecological illnesses. Furthermore, it notes that 26% of those in distraction and 16% of those in control had bleeding disorders and cancer.

**Figure 5:** Shows that 24% of the control group and 22% of the distraction group have a family history of breast cancer, while 76% of the control group and 78% of the distraction group do not.

**Table 6:** Shows how the examined samples' months of attendance at health centers were distributed. Five categories were created based on both groups' time spent in attendance. The interval of time varied from 6 to 120 months. Added to that, it was noted that, over a period of six to twelve months, 58% and 76% of them were in the control and distraction groups, respectively. 16% of the control group and 10% of the distraction group were divided into time intervals of 13–24 months. They spent almost 120 months, with 14% of that time under control and 8% in distracted group.

**Figure 6:** Shows that 78% of the control group and 68% of the distraction group had previously done a mammogram, while 22% of the control group and 32% of the distraction group had never performed a mammogram.

**Table 7:** Shows that barriers to mammography included 28% in the distraction group and 32% in the control group reporting that the exam was uncomfortable and hard to get. The reasons cited by about 30% of the control group and 24% of the distraction group are radiation fear. Moreover, 24% of the distraction group and 14% of the control group claim that there was a lack of time.

Potential causes of pre-procedure anxiety in patients are lists in **Table 8**. In terms of timing, half of the study sample in both groups believes that waiting for findings is the cause of their concern. In terms of technique, nearly half of the study sample in both groups expressed concern that the mammogram would be painful. More than two thirds of the intervention group obtained pre-procedure information and preparations, compared to only 40% of the control group.

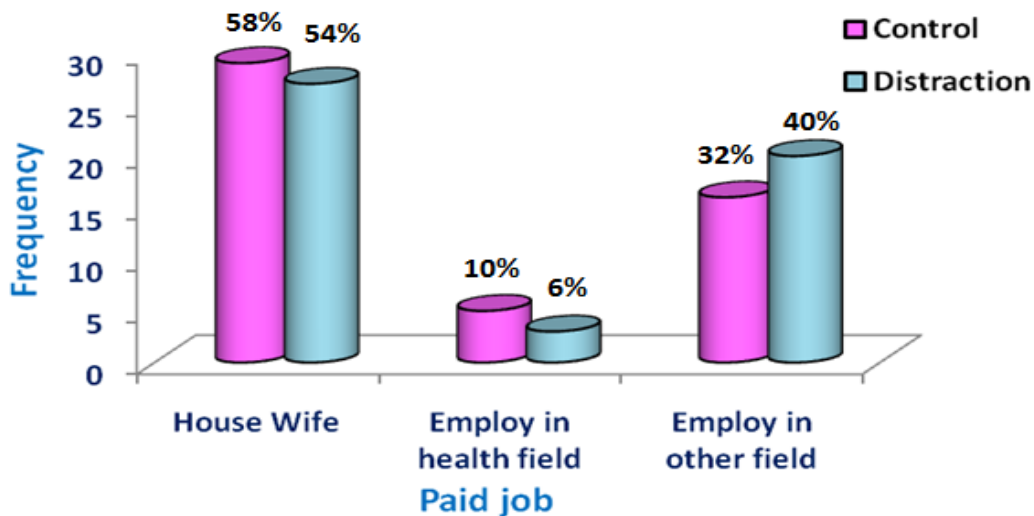
**Table 9:** Shows that the distraction group had a lower mean pain score  $2.82 \pm 2.037$  than the control group  $5.22 \pm 1.788$ , with significant differences between the two groups ( $p=0.00$ ). Additionally, there was a drop in the distraction group's mean depression score  $6.06 \pm 3.951$  compared to the control group's  $6.22 \pm 3.666$ , with no significant differences between the two groups ( $p=0.83$ ). Furthermore, a lower mean anxiety score was noted in the distraction group as compared to the control group ( $7.12 \pm 4.397$  &  $7.88 \pm 4.059$ , respectively), with no statistically significant differences between the two groups ( $p=0.37$ ).

**Table 1: Percentage distribution of the studied samples regarding their Age (N= 100)**

Age in Years	Study Group			
	Control		Distraction	
	Frequency	Percent	Frequency	Percent
45 to 49	30	60	28	56
50 to 54	6	12	6	12
55 to 59	8	16	10	20
60 to 64	5	10	5	10
65 to 69	1	2	1	2
Total	50	100	50	100

**Table 2: Percentage distribution of the studied samples regarding their educational level.**

Educational level	Study Group			
	Control		Distraction	
	Frequency	Percent	Frequency	Percent
Cannot read and write	6	12	8	16
Primary and preparatory	1	2	2	4
Secondary	6	12	6	12
University	35	70	25	50
Post graduate	2	4	9	18
Total	50	100	50	100



**Figure 1 Percentage distribution of the studied samples regarding their job.**

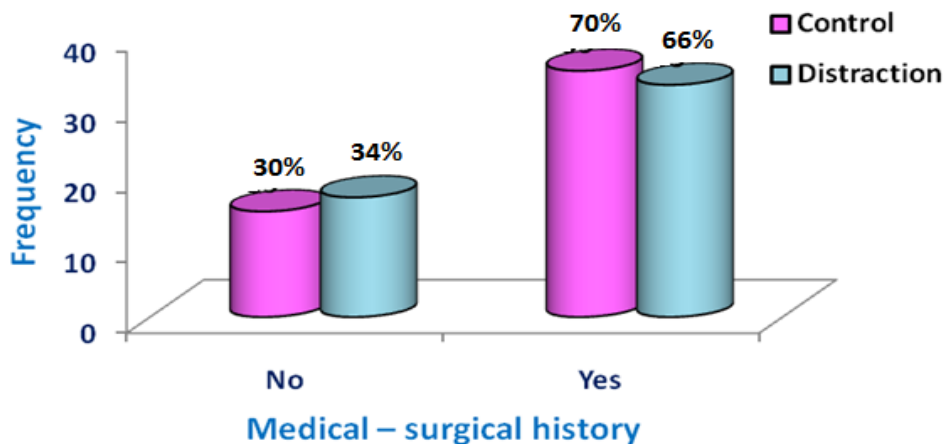


**Table 3: Percentage distribution of the studied samples regarding their marital status.**

Marital status	Study Group			
	Control		Distraction	
	Frequency	Percent	Frequency	Percent
Married	35	70	35	70
Single	8	16	3	6
Widow	3	6	4	8
Divorced	4	8	8	16
Total	50	100	50	100

**Table 4: Percentage distribution of the studied samples regarding their family income**

Family income (minimum wages)	Study Group			
	Control		Distraction	
	Frequency	Percent	Frequency	Percent
3000 - > 4000	2	4	3	6
4000 - > 6000	8	16	13	26
6000 - > 9000	22	44	19	38
More than 9000	18	36	15	30
Total	50	100	50	100



**Figure 2 Distribution of the studied samples regarding their medical-surgical history.**

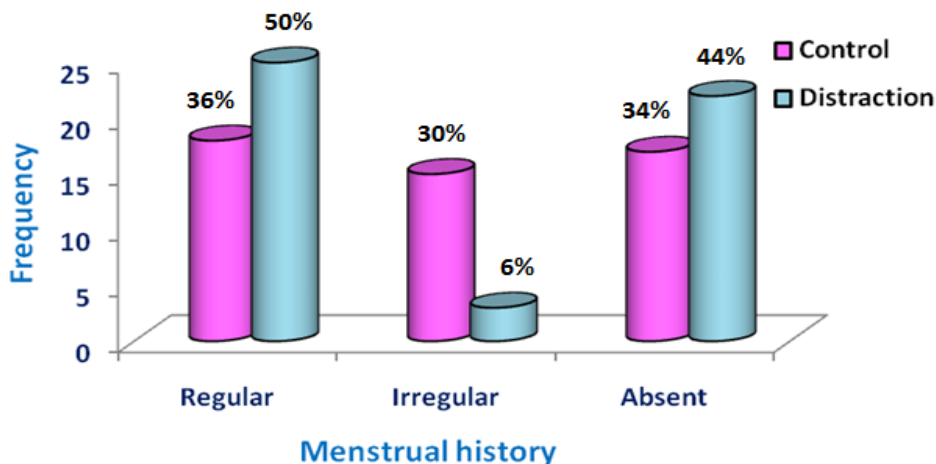


Figure 3: Distribution of the studied samples regarding their menstrual history

Table 5: Distribution of the studied samples according to number of pregnancies

Number of pregnancies	Study Group			
	Control		Distraction	
	Frequency	Percent	Frequency	Percent
None	11	22	9	18
1	4	8	4	8
2	10	20	7	14
3	8	16	4	8
More than 3	17	34	26	52
Total	50	100	50	100

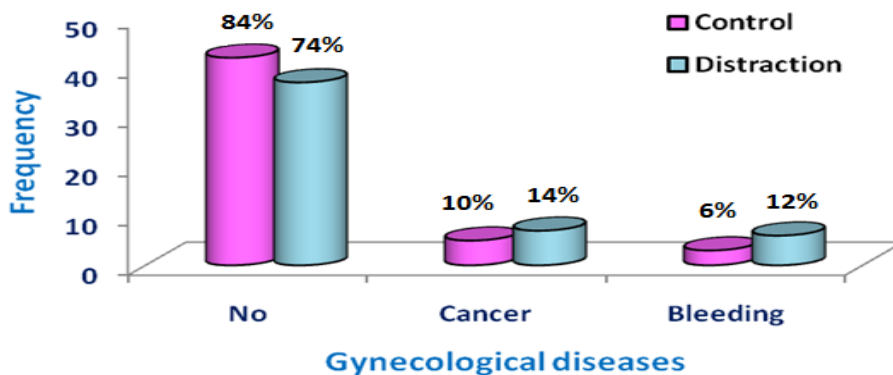


Figure 4: Distribution of the studied samples regarding their gynecological diseases

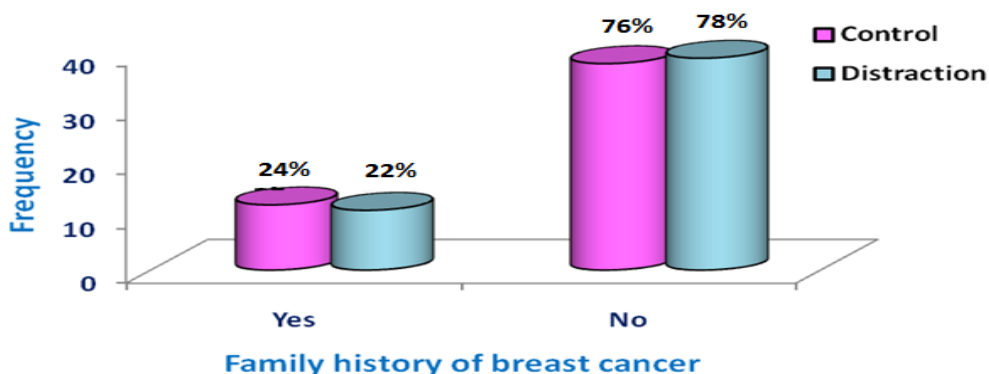


Figure 5: Distribution of the studied samples regarding their family history of breast cancer

Table 6: Distribution of the studied samples regarding their time attending health centers (months)

Time attending health centers (months)	Study Group			
	Control		Distraction	
	Frequency	Percent	Frequency	Percent
6 to 12	29	58	38	76
13 to 24	8	16	5	10
25 to 60	4	8	0	0
61 to 120	2	4	3	6
More than 120	7	14	4	8
Total	50	100	50	100

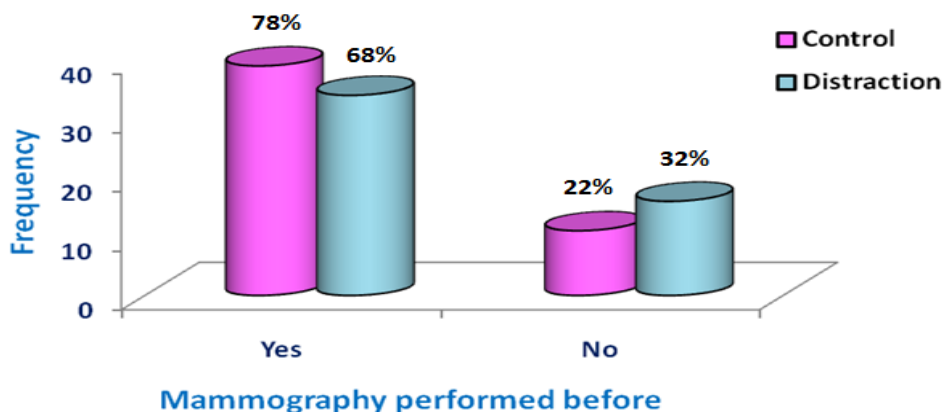


Figure 6: Distribution of the studied samples according to mammography performed before.

Table 7: Distribution of the studied samples according to barriers to mammography

Barriers to mammography	Study Group			
	Control		Distraction	
	Frequency	Percent	Frequency	Percent
No barrier	4	8	1	2
Difficult access	7	14	6	12
Painful examination	16	32	14	28
Lack of time	7	14	12	24
Fear of Radiation	15	30	12	24
Cost	1	2	5	10
Total	50	100	50	100

Table 8: Distribution of the studied samples according to factors that may be responsible for pre-procedure anxiety among patient.

Factors that may be responsible for pre-procedure anxiety among patient	Items	Cranach's Alpha	
		Control	Distraction
Time (1-6)	6	0.78	0.79
Place (7-9)	3	0.77	0.86
Staff (10-15)	6	0.64	0.43
Mammogram procedure (16-21)	6	0.90	0.82

Table 9: Distribution of the studied samples regarding to their pain score, anxiety and depression

Anxiety, Depression and Pain Scale	Study Group	N	Mean	Std. Deviation	(t-value and P-value)
Anxiety	Control	50	7.88	4.059	(0.898,0.371)
	Distraction	50	7.12	4.397	
Depression	Control	50	6.22	3.666	(0.210,0.834)
	Distraction	50	6.06	3.951	
PAIN SCORE	Control	50	5.22	1.788	(6.261,0.000)*
	Distraction	50	2.82	2.037	

### Discussion:

The most frequent malignancy to affect women is breast cancer. There is no denying that there is an inverse relationship between screening participation rates and population death reductions, even in the face of ongoing disputes on the precise number of breast cancer mortality decreases attributed to mammography screening. Even if women's reasons for participating and their obstacles to doing so are complicated, their past experiences with the screening episode are probably going to have an impact on their decision to return. Mammography can be uncomfortable, and since

this pain should be manageable, it was crucial to determine whether or not it genuinely discourages screening re-attendance (Uematsu, 2023).

Over the past 20 years, a number of studies have proven that some women do find mammograms to be uncomfortable and occasionally painful. Breast compression, the friendliness and sensitivity of the mammography technologist(s), the atmosphere of the facility, and the procedures all have an impact on a woman's comfort level during mammography. Therefore, there are a lot of tips on how to reduce pain and discomfort during a

mammogram, including: Choose a "friendly" mammography facility with skilled nurses or technologists; Take control of your own breast compression during the procedure; and Transfer mammography facilities if you're not happy with the care you receive (**Sánchez-Bayuela, 2023**). So this study was conducted to assess the effectiveness of distraction techniques on alleviating pain and anxiety in women undergoing screening mammography.

According to the results of the current study, over half of the sample in the control and distraction groups visited health centers between the ages of six and one hundred and twenty months. Furthermore, it was discovered that almost two thirds of the research sample in the distraction and control groups had previously undergone mammography. This could be because of the fact that around half of the study population was employed and approximately two thirds had only completed high educational level.

In agreement with this, **French et al. (2023)** discovered that 53% of the women they studied underwent mammography, and 54% underwent ultrasonography. Among the women in the study, 70% had been recalled for the first time and had come to our hospital; in contrast, 134 women (43%) had gotten a letter from their doctor with the screening findings, and 170 women (55%) had simply received a notice through mail. The care providers likely took the women's expectations and perceptions into account when evaluating the complaints made by patients during the mammography process in the sample under study.

Regarding the results of this study which showed the barriers of mammography, around one-third of the women in the control and distraction groups said that pain during the test and radiation anxiety were the most significant barriers. This may be because most women report experiencing pain and radiation anxiety during the compression process, which is a required step in order to lower radiation exposure and improve image quality during mammography.

On same line **Çelik (2021)** reported that there was a higher frequency of mammography

barriers among those who described the procedure as "painful and uncomfortable." Furthermore, Montoro et al. (2023) reported that two thirds of the 57 women who did not undergo mammography did so out of fear that they would experience discomfort. These women believed that mammography was a painful process.

Furthermore, **Abdelaziz (2018)** corroborated the results of this study by pointing out that 78% of the women in the study showed worry in relation to their mammography results. Regarding comfort feeling toward technologists, 334 of the study's participants, including 83.5%, reported feeling comfortable, whilst 16.5% reported feeling uncomfortably toward technologists. 31% of women reported feeling shameless during a mammography procedure, compared to 69% who felt ashamed. In addition, 12.75% of the women had inquiries about the frequency of mammograms and the radiation's effects. In terms of the technologist's cooperation, the majority of the study's participants 97.7% expressed that the technologist was cooperative and provided explanations throughout the procedure, whereas the minority 3% expressed no cooperation.

The results of the study were not in line with those of **Srinath et al. (2023)**, who investigated women's knowledge, attitudes, and practices regarding mammography among those utilizing public health services. Their findings showed that 58% of the women had never heard of mammography screening. The most common excuses given for their unwillingness to take part in clinical breast exams or mammography screenings were lack of time and expense. In order to effectively combat breast cancer, it is imperative to encourage a shift in behavior among women and healthcare professionals, particularly those who offer treatment to people with limited resources. Additionally, women's awareness, attitudes, and screening mammography practices must be improved.

The variations between the two studies could be related to the characteristics that are known to affect first-time screening attendance, such as being married, employed, having low or middle levels of education and income, being

misinformed, receiving ineffective health care communication, having competing priorities, engaging in early detection procedures, and thinking of mammography as a sensitive method for detecting breast cancer. In fact, there were significant cultural contrasts between our group and the Europeans in terms of both traits and demography. These might have had an impact on the rate of acceptance of our program (Srinath et al., 2023).

Concerning the results of the current study, it was shown that there were no statistically significant differences between the two groups, and that the distraction group had a lower anxiety mean score than the control group. This may be because the intervention proved to be highly successful in reducing screening-related anxiety.

In the same context, Kuo et al. (2021) reported that the experimental group's average mean anxiety score was  $30.63 \pm 8.43$  points, while the control group's was  $33.77 \pm 10.74$  points. This difference suggests that the experimental group had substantially experience lower levels of anxiety than the control group ( $p > .05$ ). Çelik (2021) also reported that ladies had mild anxiety when having a mammogram. Regarding the State and Trait Anxiety levels, there was also no discernible difference between the women who experienced pain during mammography and those who did not.

Similarly, modifying trait anxiety likely requires a more sophisticated and psychological approach in general. To increase overall satisfaction with breast cancer screening programs, state anxiety reduction should be adequate. Furthermore, it is imperative that women characterize mammography as a favorable technique with regard to future uses and recommend it to other women as an enjoyable experience (Dolan, 2023).

Consequently, our findings imply that women should be accompanied by qualified personnel when they arrive at the radiography department. Consequently, more studies ought to investigate the theory that reduced anxiety enhances screening program adherence. Furthermore, this theory is consistent with the views of other professionals, who note that the

primary deterrents to screening program participation are anxiety and exam fear.

Additionally, addressing anxiety should serve two purposes: (a) guaranteeing a high degree of well-being for women attending the service; and (b) increasing women's adherence to the screening program over the long run, given that women who are comfortable during a mammography testing are more likely to be satisfied with the program. Theoretically, treating anxiety could raise the women who are screened's overall survival rates Çelik (2021).

The current study's findings suggest that waiting for results is a potential source of pre-operation anxiety, as indicated by the fact that half of the study sample in both groups felt this way before the procedure. In terms of technique, nearly half of the study sample in both groups expressed concern that the mammogram was painful. More than two thirds of the intervention group obtained pre-procedure guidance and the preparations, compared to just about one third of the control group.

In agreement with this Sidek (2023) reported that, the majority of respondents experienced elevated anxiety throughout the results-waiting period, accounting for 69% of the total; this was attributed to their apprehension of receiving a positive outcome. Secondly, 58% of the respondents reported high levels of anxiety related to pain during mammography. In addition Çelik (2021) also mentioned that, many women regard mammography as an unpleasant treatment, and they may experience anxiety due to not knowing if they have cancer. Lack of accurate information can cause unexplained worry and anxiety, which can then impact one's perception of pain.

According to pain during breast compression, the majority of the studied samples in both groups reported mild, moderate, or severe pain during breast compression. Additionally, there was a significant difference in the mean pain score between the distraction and the control group. This might be because the distraction strategy worked incredibly well to lower the patient's degree of pain during the

screening mammogram. Better sensory and procedural information was also given to the women in the distraction group by the researcher before each stage of the mammography procedure. Carefully prepared videotaped things may also have been helpful in reducing the discomfort associated with the procedure.

In the same line, **Kuo et al. (2021)** stated that both the experiment group and the control group reported moderate pain, with the experiment group's average pain score being  $4.13 \pm 2.37$  and the control group's at  $4.57 \pm 2.308$ . Even though the experimental group's pain score was lower than the control group's, there was a statistically significant difference between the two groups ( $p < .05$ ).

Additionally, **Abdelaziz (2018)** found that while 13.75 percent of women reported no pain during breast compression, the majority of women (86.2%) reported mild, moderate, or severe pain (28.25 percent, 49.75 percent, and 8.25 percent, respectively). While the minority of women (0.75%) did not know the results right away, the majority of women (99.25%) knew their results after the mammography and had their queries answered right away by both the technologist and the radiologist.

Furthermore, according to **Çelik (2021)**, pain is a subjective, individual sensation, and each person has a different threshold for it. For this reason, pain is notoriously difficult to measure and define. Numerous studies have examined the pain experienced during mammography; among these are those that found that in the control group, the levels of pain were 0%, mild 24%, moderate 48%, and severe 28%. That being said, there is a large variation in the reported rates in the distraction group: none 14%, mild 60%, moderate 20%, and severe 6%. During the whole mammography examination, pain and discomfort were reported to be typical sensations.

In this respect, this means that higher anxiety levels were correlated with higher ratings for self-blame, behavioral disengagement, self-distraction, using emotional support, venting, denial, and less acceptance.

Research on the relationship between coping strategies and anxiety in relation to breast cancer screening is scarce. Remarkably, psychological discomfort was associated with both positive and negative coping strategies, such as self-distraction and venting, as well as negative coping strategies such self-blame, behavioral disengagement, denial, and reduced acceptance (**Dev et al., 2023**).

In this study, women who rely on self-distraction or venting coping strategies typically cope well on their own (i.e., they were recalled and visited the hospital). Consequently, it was determined that these two coping mechanisms were associated with an increased likelihood of receiving higher scale scores of Hospital Anxiety and Depression Medical professionals may find it easier to comprehend the psychological effects of being recalled if they are aware of the coping mechanisms used by their patients. Furthermore, understanding a person's coping mechanism may help patients in this circumstance avoid psychological suffering (**Dev et al., 2023**).

Pain has a wide behavioral and emotional influence, although being just one of many difficulties in the intricate interaction of ideas, authorities, emotions, and workplace conflicts that perpetuates mammography. In addition to potentially improving patient and front-line professional experiences, greater and more organized focus on pain management may also increase the efficacy of diagnostic procedures (**Kuo et al., 2021**). Prior to each stage of the mammography procedure, the researcher gave the women in the distraction group more precise sensory and procedural instructions. Carefully prepared filmed materials may also be very helpful in reducing the discomfort associated with the mammography procedure. The results showed that whereas only 25% of the intervention group experienced mild discomfort, over half of the control group reported having moderate to severe pain. By using a t-test, values are statistically different from prior control;  $P < 0.05$ .

On the same line, **Rahim et al. (2023)** conducted a study on the use of radiolucent cushioning pads to reduce discomfort during

mammography and noted that 73.5% of women reported significantly less discomfort on the side of the breast where the pads were placed. In those who benefited, discomfort decreased by 47%. In addition, there was a 4% reduction in dosage for the craniocaudal view and an average 14% increase in compression force on the pad side. Most of our patients (73.5%) who underwent screening mammography found that using the MammoPad radiolucent cushion on the bucky and compression paddle helped to minimize discomfort during compression. Both the quality of the images and the identification of all relevant anatomy were preserved.

These results were in line with those of Li et al. (2023), who conducted research on the use of music therapy to reduce intraoperative tension and anxiety. In a safe and effective controlled randomized clinical trial, 94.7% of patients in the music therapy group responded in the affirmative. To answer the question, "Would you choose intraoperative MT if you needed to undergo another surgical intervention?" Positive responses were given by 94% of patients who were given this therapy option. The current results provide experimental support for several clinical research and reviews that found that listening to music lowered stress-related sympathetic nervous system indices.

### Conclusions

- The majority of women having screening mammography reported feeling anxious and in pain prior to and during the procedure. According to the women in this group, their level of procedure-related discomfort and anxiety about breast cancer seems to be appropriate to their chance of getting the disease.
- By using distraction strategies, screening mammography pain and anxiety were much decreased, and the likelihood of future mammograms being performed for early breast cancer detection increased.

### Recommendations

- It is recommended that medical practitioners who are at high risk for breast cancer play a significant role in assisting

women in reducing their level of pain and anxiety during mammography by educating and advising them beforehand.

- Despite widespread agreement that a positive radiographer-patient relationship is essential to obtaining high-quality images while minimizing patient discomfort, there seems to be room for improvement in how this is incorporated into official working protocols, procedural instructions, training programs, and performance evaluation standards for radiographers.
- On a technical note, funding agencies and other service providers may want to actively encourage the application of experimentally proven pain-reduction strategies (including physical interventions like lowered compression) and make sure that the effects on patient experience are regularly considered when determining whether to upgrade equipment.

### Further studies:

- Expand the study's sample size and geographic scope to enhance the generalizability of the results.
- Analyzing how the distraction method affects practitioners' quality of life who are at high risk of breast cancer.

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