

Relationship Between Breast Size and Breast Cancer, A Case-Control Study

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Abstract

Background: Breast cancer is the most frequent cancer in the world, as well as the most common cancer in women. Gender, age, estrogen, family history, gene mutation, and an unhealthy lifestyle are all factors that can increase the risk of cancer. Because there haven't been many research looking into the effect of breast size on cancer, the goal of this study was to look into the link between breast size and the development of breast cancer.

Purpose: Evaluation of breast size in patient with breast cancer and its comparison with healthy people referred to the breast clinic of comprehensive cancer control center in the years 2021 to 2022.

Method: Many people were referred to the breast clinic of the Comprehensive Cancer Control Center between 2021 and 2022 for this case-control study, and 180 women were chosen by convenience sampling. The diameter of the breasts, the circumference of the nipple, the difference between these measurements, and the cup size were all measured and compared.

Results: The average age of the cases was 39.61 years, while the average age of the controls was 38.52 years. The case group's mean nipple circumference was 100.99, while the control groups was 98.04; the difference between the two groups was not significant. The case group's mean breast circumference was 88.99, while the control groups was 86.11. There was no discernible difference. The case group's mean size difference was 12.00, while the control groups was 11.93; the difference between the two groups was not significant.

Discussion and conclusion: Finally, there was no statistically significant difference between the case and control groups when four separate variables based on breast size were examined (breast circumference, nipple circumference, difference between variables 1 and 2, cup size).

Keywords: Breast Size, Nipple Circumference, Breast Cancer

Introduction

Female breast cancer (2.26 million new cases) is the most often diagnosed cancer worldwide, indicating a shift from lung to breast cancer [1]. Lung cancer was the most often diagnosed cancer in 2018, followed by breast cancer with 2,088,849 new cases [2]. In Iran, the average incidence of breast cancer is 33.21 per 100,000, with a death rate of 14 per 100,000. [3].

Invasive Ductal Carcinoma (IDC) is the most common kind of breast cancer in Iran and other countries, accounting for 70-80 percent of all invasive lesions [3, 4]. There are various breast cancer staging systems, all of which are somewhat different [5]. Some factors have been demonstrated to enhance the risk of

breast cancer. Breast cancer is caused by a mix of internal and external risk factors [6]. Menarche age, parity, age at first birth, and other intrinsic characteristics risk factors are examples [7]. An unhealthy BMI, sleep disturbances, and alcohol usage are examples of extrinsic risk factors [8].

Breast size is one of the characteristics that isn't totally clear as a risk factor for breast cancer. Another study found that women with large breasts are more likely to have advanced breast cancer [9]. Large bra cup sizes are linked to an increased risk of breast cancer in premenopausal women [10]. Recent research has found no indication of a direct link between breast size and breast cancer [11]. The aim of our study is if there's a link be-

tween breast size and breast cancer in Iranian women.

Material And Methods

People came to the breast clinic of the Comprehensive Cancer Control Center in 2021 and 2022 to be seen by breast fellowships. We required a case-control study to examine nipple circumference, breast circumference, the difference between the two, and breast cup size in two case and control groups. It was crucial to define these two groups before measuring. The age range of case and control group was between 35 and 70 years. A case group was defined as a patient who has been diagnosed with breast cancer (IDC and ILC type). An aberrant finding in a physical examination must be supported by sonographic or mammographic imaging to show IDC and ILC. When BIRADS > 4c was detected on sonography or mammography, or when a physical examination revealed an abnormal finding, a core needle biopsy (CNB) should be performed to identify whether the abnormal finding was IDC, ILC or something else. CNB's response, which demonstrated IDC or ILC, was a document indicating that the patient belongs in the case group. Several patients who visited the comprehensive cancer control center's breast clinic and did not have any lumps on physical examination, sonography, or mammography were placed in the control group. There were also some other requirements for taking part in the study. Patients must not have cancer in any other part of their body. Patients should not be placed in these case or control groups if

there were any signs of metastases. Patients with a history of neoadjuvant therapy that resulted in lump shrinking (as measured by comparing lump size in two separate mammography or sonography scans) or a history of breast surgery should not be investigated. There was no obligation for anyone to participate if they did not want to for whatever reason. This study was confirmed by ethic committee of Azad university of Tehran, medical branch, by the code of IR.IAU.TMU.REC.1399.560. The patient's age had a limit. Only women between the ages of 35 and 70 may be affected. Finally, 90 patients were chosen for the case group and 90 patients for the control group. Following careful selection of who should be in the case and who should be in the control group, four variables should be measured. Breast circumference, nipple circumference, and the difference between the two, as well as breast cup size when the data was collected, it was analyzed using SPSS version 24 and an Independent simple T-Test to check if there were any differences in the four variables. The outcomes of the data analysis are discussed further down.

Results

As previously stated, there were 90 patients in the case group and 90 in the control group. A case group is defined as a patient who has been diagnosed with breast cancer (IDC type). In the case group, the average age was 39, 61, while in the control group, it was 38, 52.

Table 1: Nipple circumference in case and control groups

	Breast cancer	N	Mean	Std. Deviation	Std. Error Mean	Minimum	Maximum
Nipple circumference	positive	90	100.99	11.875	1.252	76	130
	negative	90	98.04	9.224	0.972	81	117

The first thing to consider is nipple circumference. The data on nipple circumference is shown in Table (1). The mean nipple circumference was 100, 99 in the case group and 98, 04 in the control group. The table shows the smallest and largest nipple circumferences. The difference in nipple circumference size between the case and control groups was not statistically significant (p value=0.065)

Breast circumference was another variable mentioned. Table (2) compares the case and control groups' breast circumference measurements. The case group's average breast circumference was 88, 99 cm, while the control group's average was 86, 11 cm. The table now includes the minimum and maximum sizes of breast circumference. The difference between the case and control groups' breast circumference was not statistically significant (P value = 0.055)

Table 2: Breast circumference in case and control groups

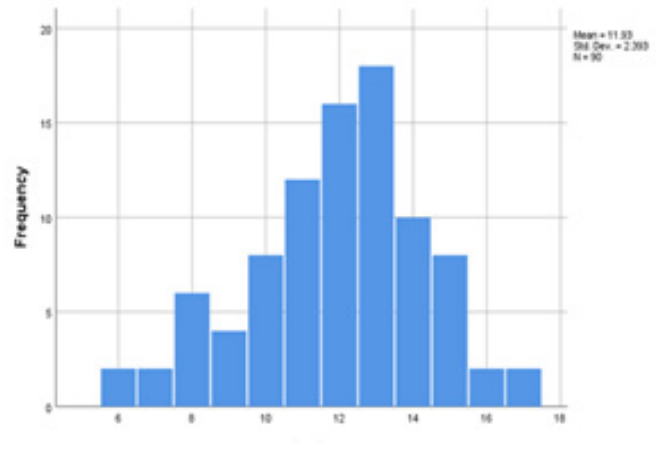
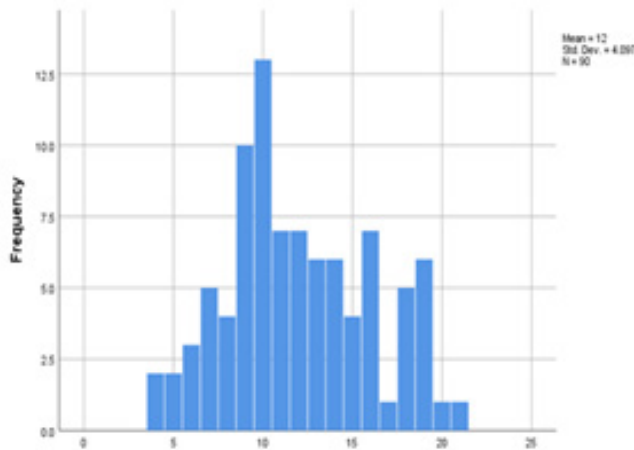
	Breast cancer	N	Mean	Std. Deviation	Std. Error Mean	Minimum	Maximum
Breast circumference	positive	90	88.99	11.352	1.197	64	116
	negative	90	86.11	8.366	0.882	71	103

The difference between nipple circumference and breast circumference, which represents breast size, is the third variable. This variable, as well as some other information about it, is shown in Table (3). The average breast size in the case group was 12 cm, while the average breast size in the control group was 11, 93 cm. The table now includes the minimum and greatest discrepancy between nipple circumference and breast circumference (P value = 0.894)

Table 3: Difference between nipple circumference and breast circumference

	Breast cancer	N	Mean	Std. Deviation	Std. Error Mean	Minimum	Maximum
difference	positive	90	12.00	4.097	0.432	4	21
	negative	90	11.93	2.393	0.252	6	17

The frequency of this variable is depicted in graphs (1) and (2). The most common discrepancy in the case group is 10 cm, whereas the control group had a difference of 13 cm. between the case and control groups, there is no significant difference in nipple circumference or breast circumference.



Graph (1): Frequency of difference in case group

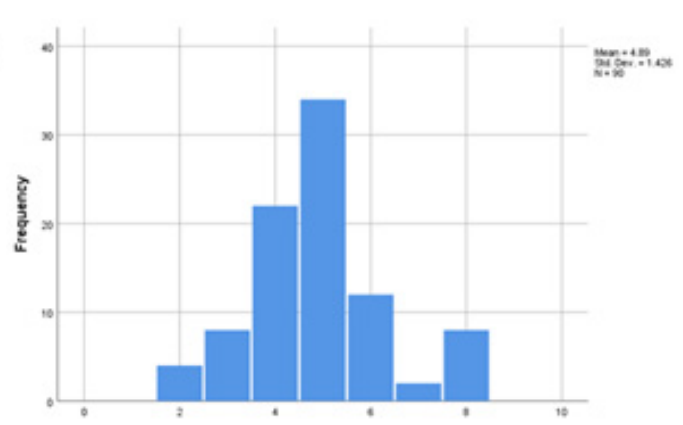
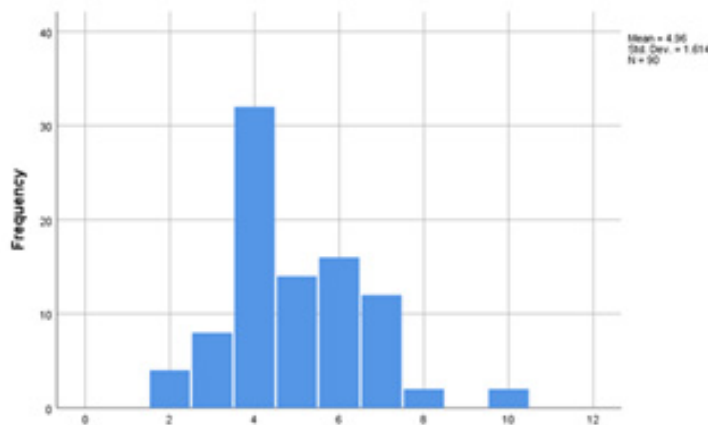
Graph (2): Frequency of difference in control group

The last variable to be examined is the size of the breast cup. The size of the breast cup in the case and control groups is shown in Table (4). As can be seen, the average size of the breast cup in the case group was 4, 96, whereas in the control group it was 4, 89.

Table 4: Breast cup size in case and control groups

	Breast cancer	N	Mean	Std. Deviation	Std. Error Mean	Minimum	Maximum
Breast cup size	positive	90	4.96	1.614	0.170	2	10
	negative	90	4.89	1.426	0.150	2	8

The frequency of breast cup size in the case and control groups is shown in graphs (3) and (4). Following data analysis, it was discovered that there is no statistically significant difference in breast cup size between the case and control groups (P value = 0.067)



Graph (3): Frequency of breast cup size in case group

Graph (4): Frequency of breast cup size in control group

Discussion

There are some theories on the link between breast size and breast cancer. This topic has been the focus of several investigations. Some of the outcomes matched ours, while others did not. The following are some of the studies that were conducted. According to a study, having a large breast size increased the risk of advanced breast cancer (P value = 0.019) [9]. Another study found that having a large bra cup size at a young age is linked to a higher risk of breast cancer in postmenopausal women (P value = 0.01) [10]. Breast size prior to pregnancy is a favorable predictor of postmenopausal breast cancer (P value = 0.005), according to a study [12]. An older study from 1997 also found a link between large breasts and breast cancer (P value 0.0001) [13]. One of the earliest studies on this topic was published in

1991, and it found that having a big cup size increases the risk of breast cancer (P value = 0.026) [14].

Some research, however, contradict the notion that there is a link between breast size and breast cancer. One of them shows that there is no statistically significant difference between big and small breasts in terms of cancer development (P value = 0.001) [15]. Another study found that having a large breast size does not increase the risk of breast cancer (P value = 0.001) [16]. Breast size is not a predictive or causative factor in early breast cancer, according to another study (P value = 0.001) [17].

Our goal is to see if there is a link between breast size and breast cancer using four variables: nipple diameter, breast circumfer-

ence, the difference between these two, and breast cup size. Four factors were assessed in two groups of 90 patients. According to the data, there is no statistically significant difference between these four characteristics and breast cancer (P values = 0.065, 0.055, 0.894, and 0.067).

There are a few areas where this topic might be expanded. One of them is incorporating BMI or breast asymmetry as established breast cancer risk factors. Including more patients in case and control groups was a proposal that was not feasible due to the global spread of COVID-19.

Conclusion

According to our research and the data we gathered and presented previously, there is no link between breast size and breast cancer.

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