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## Acceptance and awareness of breast reconstruction surgery among educated women in Almadinah Almunawwarah, Kingdom of Saudi Arabia: A community-based study

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**ABSTRACT**

**Objectives:** Breast health awareness is a necessary subject for women because breast cancer is one of the most commonly diagnosed cancers in Saudi Arabia and a major cause of death related to cancer, which motivated us to inspect the knowledge of women in our society regarding reconstruction surgery. **Methods:** A cross-sectional study was conducted among educated females in Almadinah to determine the awareness and acceptance of breast reconstruction surgery. An online validated questionnaire was used to collect the data. Analysis of the data was carried out using RStudio (R version 4.1.1). **Results:** We analyzed the responses of 342 participants in this study, most of whom were Saudis (97.7%). The majority of respondents admitted that breast reconstruction is important to them (89.2%); the most common reason among the participants who did not accept breast reconstruction surgeries (22.8%) was a procedural failure. **Conclusion:** We concluded that the majority of women used social media as their source of information, but we still saw a lack of knowledge regarding the surgical options for breast reconstruction, while acceptance of reconstruction was high.

**Keywords:** Awareness, Breast, Breast cancer, Breast reconstruction.

**1. INTRODUCTION**

Breast cancer is a significant malady that negatively influences the quality of life of an individual; it is the most frequently diagnosed cancer and the second leading cause of cancer-related mortality among women in Saudi Arabia, after lung cancer (Saggu et al., 2015). Breast cancer treatment has markedly

improved with new advances in early detection, endocrine therapy and breast conservation surgical techniques. Treatment options for early-stage breast cancer include breast conservation surgery and mastectomy. Each treatment line can potentially affect the patient's quality of life across several domains, particularly psychosocial sequela of mastectomy (Collins et al., 2011). Previous studies have shown that women who undergo mastectomy are more vulnerable to having more severe psychosocial issues, including anxiety, sexual and body image issues and depression. Moreover, these conditions are associated with a higher mortality rate among breast cancer patients; therefore, it is crucial to improve the psychology of patients with breast cancer after mastectomy (Rosenberg et al., 2020; Al-Ghazal et al., 2000; Chen et al., 2018). Breast reconstruction improves the patient's body image and sexual function and decreases the psychosocial morbidity associated with mastectomy by surgically restoring the breast's natural appearance (Chen et al., 2018; Nair et al., 2021). Breast reconstruction acceptance and refusal factors vary, including age, marital status and knowledge about breast reconstruction, quality of life, family income and social support. According to a study, the most influential factor for acceptance was the improvement of the patient's psychological status, while the most common reason for refusal was old age; patients with more knowledge of the procedure were more willing to accept it (Gong et al., 2018; Alkaff et al., 2019). This study aims to assess the awareness, knowledge and acceptance of breast reconstruction surgery among educated women in Almadinah, Kingdom of Saudi Arabia.

## 2. MATERIALS AND METHODS

A cross-sectional study was carried out to assess the awareness and acceptance of breast reconstructive surgery among educated females in Almadinah. A self-administered online validated questionnaire was used to collect the data from October 26, 2022 to November 10, 2022. The ethical committee of Almadinah Health Cluster gave their approval before the study initiation (IRB log number 22-094). Sample sizes of 383 female participants were obtained. Data were collected using the Google Forms online platform ([www.docs.google.com/forms](http://www.docs.google.com/forms)). The survey was developed based on a prior survey used to investigate acceptance and awareness of breast reconstruction surgery in Hail (Fathuldeen et al., 2022). The main differences between the questionnaire utilized by Fathuldeen et al., (2022) and our questionnaire include the following: participant opinion regarding the importance of breast reconstruction, non-surgical options for breast reconstruction and a certain age for breast reconstruction. These three questions have been included in the study, while Fathuldeen et al., (2022) did not mention them. The agreement of the participants to complete the questionnaire was considered consent to participate. Participation in the survey was entirely voluntary. The participants were not subject to any harm. The participants' anonymity was secured. Collected data were not disclosed to any third party outside the research team.

### Statistical Analysis

Data analysis was carried out using RStudio (R version 4.1.1). We used frequencies and percentages to express categorical variables. Items with multiple responses were analyzed using a multiple response analysis. We used bar charts to depict the sources of information about breast reconstruction and its available surgical options. Additionally, the psychological effects of mastectomy were depicted using a stacked bar chart.

## 3. RESULTS

### Demographic characteristics of the participants

We analyzed the responses of 342 participants in the current study. Participants aged < 30 represented 38.9% of the sample and most participants (97.7%) were Saudis. More than half of the participants were married (55.0%) and had obtained a bachelor's degree (55.6%). In general, 15 participants (4.4%) had experienced a breast mass at any time. Out of these, 73.3% had benign lesions on the left side among 46.7% of participants (Table 1).

**Table 1** Characteristics of the participants' demographics

Parameter	Category	N (%)
Age	<30	133 (38.9%)
	30 to <45	100 (29.2%)
	45 to <60	94 (27.5%)
	60 or more	15 (4.4%)
Nationality	Saudi	334 (97.7%)
	Non-Saudi	8 (2.3%)

Marital status	Single	131 (38.3%)
	Married	188 (55.0%)
	Divorce	16 (4.7%)
	Widow	7 (2.0%)
Educational level	Student	94 (27.5%)
	Diploma degree	51 (14.9%)
	Bachelor degree	190 (55.6%)
	Doctorate degree	7 (2.0%)
Ever had a breast mass	Yes	15 (4.4%)
If yes, type of the mass*	Benign	11 (73.3%)
	Malignant	4 (26.7%)
Side*	Right side	6 (40.0%)
	Left side	7 (46.7%)
	Both	2 (13.3%)

\*The frequencies and percentages are based on 15 participants who ever had a breast mass.

### Awareness about breast cancer

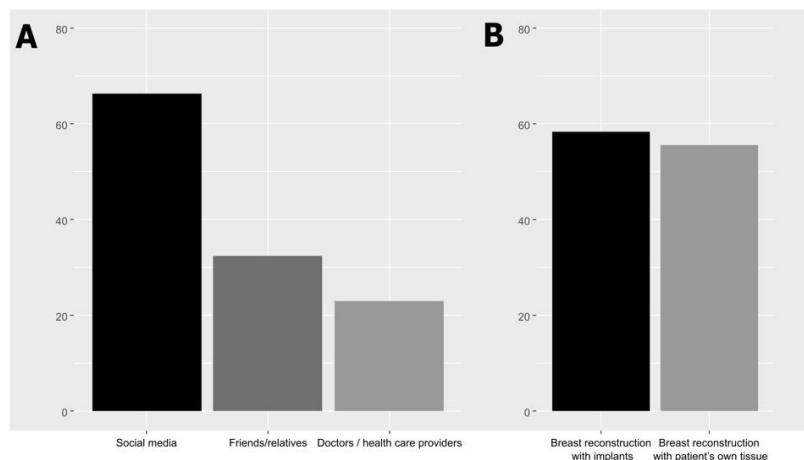
Based on the participant's responses, the most common warning signs of breast cancer were breast lumps (83.0%), bloody nipple discharge (60.2%) and changes in breast shape or size (57.6%). Breast self-examination was the most frequently reported method for the early detection of breast cancer (69.6%) and surgery was the most common method of treatment (72.5%) (Table 2).

**Table 2** Awareness about breast cancer

Parameter	Category	N (%)
Warning signs of breast cancer	Breast lump	284 (83.0)
	Bloody nipple discharge	206 (60.2)
	Breast pain	147 (43.0)
	Changes in breast shape or size	197 (57.6)
	Retraction of the nipple	137 (40.1)
	Redness of breast skin	129 (37.7)
Methods for early breast cancer detection	Breast ultrasonography	69 (20.2)
	Mammography	183 (53.5)
	Breast self-examination	238 (69.6)
Methods of breast cancer treatment	Chemotherapy	181 (52.9)
	Surgery	248 (72.5)
	Radiotherapy	100 (29.2)
	Hormonal therapy	78 (22.8)

### Knowledge about the possibility of breast reconstruction after mastectomy

In general, more than half of the respondents (59.9%) indicated that they knew about the possibility of breast reconstruction after breast removal for cancer treatment (Table 3). The most prevalent sources of information about breast reconstruction included social media (66.4%) and friends and relatives (32.5%) (Figure 1A). More than half of women knew about implant-based reconstruction (58.5%) and surgeries based on patients' tissues (55.6%) (Figure 1B).



**Figure 1** Participants' responses regarding the sources of information (A) and surgical options (B) of breast reconstruction surgeries

Additionally, 42.4% of them did not indicate that they believe there is a specific age range that is recommended for breast reconstruction. Almost two-thirds of the respondents (69.9%) stated that breast reconstruction surgeries should be performed in a separate operation after mastectomy. The majority of respondents admitted that breast reconstruction is important (89.2%), safe (70.2%) and can restore the appearance of the breast close to its preoperative state (57.0%). However, only 33.3% of the women in the study knew who could perform these surgeries and only 15.8% knew about the advantages and disadvantages of immediate and delayed reconstruction. Furthermore, 19.3% of the participants knew the procedural risks and complications. Notably, approximately three-quarters of the respondents (74.3%) were willing to undergo breast reconstruction surgery if the doctor mentioned it to the participant (Table 3).

**Table 3** Knowledge about the possibility of breast reconstruction after mastectomy

Parameter	Category	N (%)
Do you think there are non-surgical options for Breast reconstruction	No	54 (15.8%)
	Yes	46 (13.5%)
	Do not know	242 (70.8%)
Do you know that it is possible to reconstruct the breast(s) after removal of one or both breasts in the context of breast cancer treatment	No	137 (40.1%)
	Yes	205 (59.9%)
Do you think there is a certain age for breast reconstruction	No	145 (42.4%)
	Yes	48 (14.0%)
	Do not know	149 (43.6%)
When do you think that breast reconstruction can be performed	In a separate operation after the surgical removal of the affected breast(s)	239 (69.9%)
	Simultaneously with the surgical removal of the affected breast(s).	103 (30.1%)
Do you think breast reconstruction is important	Not important	11 (3.2%)
	Does not matter	26 (7.6%)
	Important	305 (89.2%)
Is breast reconstruction safe?	No	102 (29.8%)
	Yes	240 (70.2%)
Do you think that breast reconstruction can restore the appearance of the breast close to its preoperative state?	No	147 (43.0%)
	Yes	195 (57.0%)
Are you aware where these surgeries are	No	228 (66.7%)

performed and who do them?	Yes	114 (33.3%)
Do you know the advantages and disadvantages of immediate and delayed reconstruction?	No	288 (84.2%)
	Yes	54 (15.8%)
Are you aware of the risks and complications associated with the breast reconstruction surgeries?	No	276 (80.7%)
	Yes	66 (19.3%)
Do you think that health insurance cover breast reconstruction surgeries?	No	68 (19.9%)
	Yes	39 (11.4%)
	Do not know	235 (68.7%)
Are you willing to do the surgeries if your doctor has mentioned it to you?	No	88 (25.7%)
	Yes	254 (74.3%)

**Acceptance of and attitudes about breast reconstruction**

Out of the included participants, only two respondents had undergone a breast reconstruction previously (0.6%). Most women (77.2%) accepted the idea of breast reconstruction. The most common reasons for acceptance were psychological status (84.8%), femininity (59.5%) and wanting to feel whole again (56.8%). Contrastingly, the most common reasons among the participants who did not accept breast reconstruction surgeries (n=78, 22.8%) were a procedural failure (46.2%), as well as the perceived possibilities of cancer recurrence, implant rupture and cancer (25.6%) for each (Table 4).

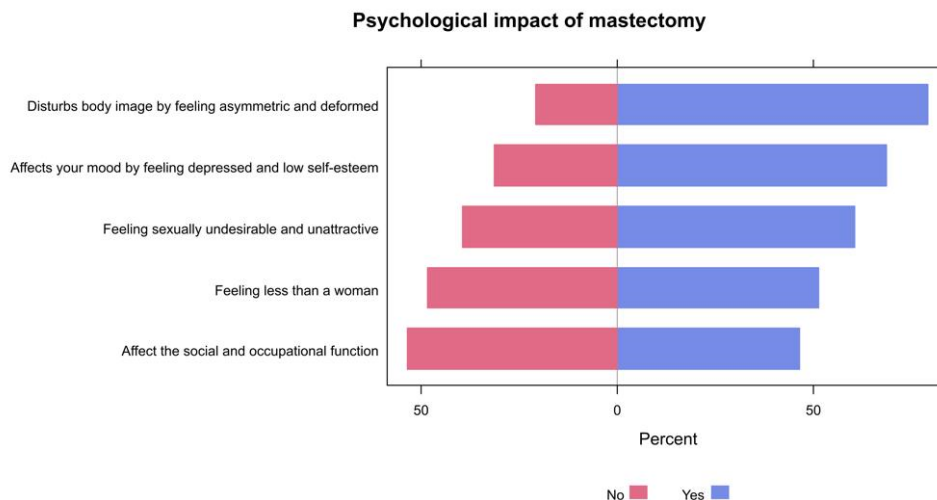
**Table 4** Acceptance of breast reconstruction

Parameter	Category	N (%)
Did you have a breast reconstruction before?	No	340(99.4%)
	Yes	2 (0.6%)
Do you accept the idea of breast reconstruction?	No	78 (22.8%)
	Yes	264(77.2%)
If yes, why?	Wear clothes	105 (39.8)
	Psychological status	224 (84.8)
	Whole again	150 (56.8)
	Femininity	157 (59.5)
	Community judgment	36 (13.6)
	Doctor recommendation	101 (38.3)
If no, why?	Procedure failure	36 (46.2)
	Too old to do the surgery	10 (12.8)
	Community judgment	5 (6.4)
	Religiously prohibited	5 (6.4)
	Shape of the new breast	11 (14.1)
	Cancer recurrence	20 (25.6)
	If the breast implant ruptures	20 (25.6)
	It may cause cancer	20 (25.6)
	Afraid that Breast reconstruction could hide the recurrence cancer	10 (12.8)
	High cost	10 (12.8)
	The doctor did not mention/recommend it	15 (19.2)
	More surgeries	17 (21.8)

**The psychological impact of mastectomy**

The most commonly perceived psychological effects of mastectomy included disturbing body image by feeling asymmetric and deformed (79.2%) and depression and low self-esteem (68.7%). Conversely, the least significant psychological impacts affected the

patients' social and occupational function (53.5%) and feeling as a woman (48.5%) (Figure 2).



**Figure 2** Participants' responses regarding the psychological impact of mastectomy

#### 4. DISCUSSION

Breast cancer is one of the most common cancers diagnosed in Saudi Arabia and a leading cause of cancer-related death. Because of this, we must assess the level of information among women in our culture regarding reconstruction surgery and available treatment options (Saggu et al., 2015). According to the data in this research, the total number of participants was 383. Most participants were Saudi women who were married and had bachelor's degrees. When compared to other studies conducted in Saudi Arabia, the findings revealed that the participants' demographic characteristics were almost identical, with most of them being Saudi, married and bachelor's degree holders (Alkaff et al., 2019; Mortada et al., 2020; Fathuldeen et al., 2022). Among the women in the study, a lack of awareness of the warning signs of breast cancer and the surgical choices for breast reconstruction was observed. Additionally, few women were aware of other non-surgical management options like radiotherapy and hormone therapy. This result was similar to other research (Fathuldeen et al., 2022), but it was the opposite when compared to others (Kothari et al., 2012; Abbas, 2016; Familusi et al., 2019). This can be explained by the fact that most participants used social media as their main source of information, which was evident in both educated and uneducated women, the same observation that was reported in similar research (Fathuldeen et al., 2022).

In this study, most of the participants had not had breast reconstruction before, which was similarly reported in another research study (Fathuldeen et al., 2022). More than three-quarters of the participants accepted the idea of breast reconstruction; the same result was also reported in another study (Fathuldeen et al., 2022). However, when compared to a different study (Alkaff et al., 2019), the finding was the opposite. Most of the participants believed that the reconstruction could improve their psychological status, which was proven in another research study (Chen et al., 2018). Many women believed that breast reconstruction could help them regain their femininity and a sense of wholeness by improving their body image, which could also assist in preventing serious psychological issues; these results are supported by other studies as well (Al-Ghazal et al., 2000; Fathuldeen et al., 2022). In our data, there was inadequate knowledge among the respondents regarding the timing of breast reconstruction and where or by whom it is performed, which shows similar results to those reported by other studies (Fathuldeen et al., 2022; Kothari et al., 2012).

Regarding age restrictions related to performing breast reconstruction surgery, we found that 145 (42.4%) of our participants answered that there is no recommended age for breast reconstructions surgeries and 149 (43.6%) did not know about age limitations; other studies had a lack of information regarding this aspect. Likewise, we saw a marked lack of knowledge about the advantages and disadvantages of immediate and delayed reconstruction, which accounts for only 15.8% of the total participants acknowledged. In comparison to the other study conducted in Hail (Fathuldeen et al., 2022), we found that only 18.3% out of 383 participants were aware of the differences between late and early reconstruction. As for the risks and complications associated with breast reconstruction surgeries, in our study, 66 (19.3%) of the total participants were aware of these factors, which is consistent with the Hail study (Fathuldeen et al., 2022) that showed 85 (22.2%). One more interesting finding was that more than two-thirds of the participants didn't know if health insurance covered breast reconstruction surgeries or not. Even though most Saudi citizens receive treatment at free government hospitals, these findings are consistent with the Hail study (Fathuldeen et al., 2022), while

68.1% of the total 462 participants in a similar Turkish study answered that health insurance doesn't cover this type of surgery (Abbas et al., 2016).

Many participants believed that having a mastectomy affected their body image, making them feel asymmetrical and malformed. In this case, breast reconstruction can help correct the disturbance in body image, leading to greater acceptance and reduced psychosocial morbidity. Additionally, many women believe that having a mastectomy will make them feel down or impair their self-esteem, which is supported by Al-Ghazal's research (Al-Ghazal et al., 2000) in which women experienced depression more after a mastectomy than after less invasive procedures like a wide local excision. Social media is an important platform for informing people, but if it is not properly monitored, it can lead to many misunderstandings. This can be a significant barrier to breast reconstruction, which has a significant negative impact on the psychological morbidity of patients who have undergone mastectomy.

### Limitations

Our study had some limitations, as women were surveyed from one region of Saudi Arabia. Consequently, our findings, though significant, might not be generalizable to women in all regions. Using an online survey dataset can be a potential source of bias.

## 5. CONCLUSION

This study found that people tend to accept breast reconstruction procedures, but many have some deficits in their knowledge regarding the advantages and disadvantages of breast reconstruction and the complications of this procedure. This can cause anxiety and prevent such women from considering breast reconstruction after mastectomy. All of these issues and more can be mitigated with programs designed to teach people about their options via social media.

### Author Contributions

BA, OA, WA and AA conceived and designed the study and provided the research materials. OA, AA, WA, HA and AA collected and organized the data. AA, AB, YA, MM and AA analyzed and interpreted the data. OA, AA, AA, MM, AB and YA wrote the initial and final drafts of the article. All authors critically reviewed and approved the final draft and are responsible for the content and similarity index of the manuscript.

### Ethical Approval

The ethical approval for this study was granted from the ethical committee at the College of Medicine at Al Madinah Health Cluster, Al-Madinah Al-Munawwarah, Kingdom of Saudi Arabia, IRB log number 22-094.

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This study has not received any external funding.

### Conflict of interest

The authors acknowledge that there are no possible conflicts of interest in the manuscript, including financial, consultant, institutional and other relationships that might lead to bias.

### Data and materials availability

All data sets collected during this study are available upon reasonable request from the corresponding author.

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