

# Patient Perceptions and Determinants of Choice for Breast Reconstruction after Mastectomy among Saudi Patients

Hattan A. Aljaaly, MD, FRCSC,  
MRM\*  
Hatan Mortada, MBBS†  
Nora H. Trabulsi, MD, MSc‡

**Background:** Undergoing mastectomy is often associated with a negative impact on the mental well-being of patients. Patients who undergo postmastectomy breast reconstruction (BR) have a better self-image and higher self-esteem. Many patients with breast cancer (BC) are unaware of the availability of BR options. This study aimed to assess BC patient perceptions and identify the determinants of patient choices to undergo BR after mastectomy.

**Methods:** This study was conducted between May 10, 2019 and February 29, 2020 via an interview-based questionnaire, among BC patients at King Abdul Aziz University Hospital, Jeddah, Saudi Arabia. Ethical approval was obtained from the research ethics committee before the data collection.

**Results:** Altogether, 400 patients (an overall 82% response rate) were included, of whom 155 (38.75%) were group 1 (willing to undergo BR). The mean age for group 1 was  $46.04 \pm 8.79$ , which was younger than for group 2 (unwilling to undergo BR) ( $P < 0.001$ ). Furthermore, 117 (75.5%) of group 1 had no history of any chronic illness compared with 145 (59.2%) of group 2 ( $P < 0.001$ ). Group 1 had more knowledge about BR (69.7%,  $P < 0.001$ ), and the main reason to undergo BR was to regain femininity (26.8%). The remaining patients (31.3%) were unwilling to undergo BR in order to avoid additional surgery.

**Conclusions:** The lack of knowledge and misconception about BR is one factor preventing BC patients from undergoing BR. Spreading awareness and providing accurate information regarding the procedure will allow women with BC to overcome postmastectomy fear. (*Plast Reconstr Surg Glob Open* 2021;9:e3750; doi: 10.1097/GOX.0000000000003750; Published online 22 September 2021.)

## INTRODUCTION

In Saudi Arabia, the most common type of cancer in women is breast cancer (BC),<sup>1</sup> accounting for approximately 20% of all cancer deaths in Saudi women.<sup>2</sup> In BC treatment, surgical management is the first and primary modality to cure the disease.<sup>3,4</sup> However, surgery

remains an unpleasant experience for a patient with BC.<sup>5</sup> Undergoing mastectomy is a life-changing event, which is often associated with a strong negative impact on patients' mental well-being.<sup>6</sup> Women who have undergone mastectomy may experience a loss of femininity, resulting in a reduction in their confidence level.<sup>7</sup> This is of particular concern in Saudi women because women in Saudi Arabia are regarded as carriers of family honor and thus carry more expectations of society's compliance in all aspects, including a physical image.<sup>8</sup>

Breast reconstruction (BR) is a suitable option for women who have undergone a mastectomy, as BR provides an essential component for BC patients in restoring the breasts.<sup>9-11</sup> Patients who undergo BR have a better self-image, healthier sexual life, and a higher level of self-esteem than those who do not undergo BR.<sup>12-14</sup> The number of patients who undergo BR has increased over the last decade, although it is still relatively low, ranging from 5% to 42%.<sup>15,16</sup> A survey conducted by the American Society of Plastic Surgeons shows that approximately 80%

From the \*Division of Plastic Surgery, Department of Surgery, Faculty of Medicine, King Abdulaziz University, Jeddah, Saudi Arabia; †Division of Plastic Surgery, Department of Surgery, King Saud University Medical City, King Saud University and Department of Plastic Surgery & Burn Unit, King Saud Medical City, Riyadh, Saudi Arabia; and ‡Division of General Surgery, Department of Surgery, Faculty of Medicine, King Abdulaziz University, Jeddah, Saudi Arabia.

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of women are unaware of the availability of the wide range of options for BRs.<sup>17</sup> A previous study revealed that seven of 10 women diagnosed with BC are never informed about BR options suitable for them.<sup>17</sup> Among those who were aware of BR, previous studies have established the factors that affect the choice of undergoing BR after mastectomy. The most common reason for not undergoing BR after mastectomy was the fear of cancer relapse.<sup>18</sup> Another study found that age influences the rate of BR; older women are less likely to undergo BR after mastectomy.<sup>19</sup> Failure of general surgeons to routinely discuss postmastectomy BR options is also a contributing factor.<sup>20</sup> Sugrue et al used the BREAST-Q questionnaire<sup>21</sup> among 30 patients undergoing mastectomy and BR, and they found that the outcomes are well accepted by the patients and the acceptable outcomes level for patients.<sup>22</sup>

Many earlier studies reported that patients who have undergone lumpectomy or mastectomy are not knowledgeable regarding the reconstruction options available to them.<sup>18,23</sup> The perception of BR among BC patients is poorly understood in Saudi Arabia. Therefore, this study aimed to assess BC patient perceptions and identify the determinants of patient choices to undergo BR after mastectomy.

## MATERIALS AND METHODS

### Ethical Approval

This study was conducted after receiving ethical approval from the research ethics committee of King Abdulaziz University, Jeddah, Saudi Arabia. Patients voluntarily contributed to this study. Written informed consent was obtained from all the patients before they participated in the study.

### Study Design and Data Collection

This cross-sectional study was conducted between May 10, 2019 and February 29, 2020, by an interview-based questionnaire. The interview was conducted by volunteers who delivered the questionnaire personally among women (18 years and older) diagnosed with BC at King Abdulaziz University Hospital, Jeddah, Saudi Arabia. Responses were recorded anonymously. All patients were informed about the study, and those who agreed to participate were enrolled. We excluded patients who refused to participate, failed to complete the questionnaire, or underwent mastectomy with BR. The total number of patients required for the study was estimated using an online sample calculator (Raosoft) with a 5% margin of error and a 95% confidence level. The estimated required sample size was 250, and a total of 400 individuals participated in this study for better representation.

### Variables for the Questionnaire

After reviewing the literature, we developed our questionnaire based on a previously published survey.<sup>20,24</sup> It was tested before distribution through a pilot study, and responses were used for refinement and face validity was assessed by two experts.

The questionnaire comprised 31 variables divided into three main parts. The first part focused on patient-related demographic data, including age, nationality, marital status, menopausal status, education, household income, smoking status, and chronic illnesses. The second part involved questions about BC, including time since BC diagnosis, forms of treatment received, family history of BC, and other physicians involved in the management plan. The third part was related to the patient's perception of BR. It included questions regarding prior knowledge of BR, the extent of knowledge about BR, how they heard about BR, willingness to undergo BR, and barriers to BR. Lastly, the questionnaire also included a question to assess the patient perceptions of their body images.

### Statistical Analysis

Data were checked for completeness. Descriptive statistics were used to present the data in tables and charts. Patients willing to undergo BR (group 1) and those unwilling to undergo BR (group 2) were compared for all the studied variables. Age was compared using the Mann-Whitney U test. Cross-tabulations were created to compare other studied variables. Chi-square values were presented as *P* values. If the values in a cell were less than five during any comparison, then the Fisher exact value was presented. The analysis was performed with a 95% confidence interval using the software Statistical Package for Social Science, version 24.0 (IBM, Armonk, N.Y.).

## RESULTS

The current study included 400 patients with an overall 82% response rate. The mean age of the patients was 50.65 ( $\pm$  11.17) years. Further, 164 (41%) patients were Saudi, the monthly income of 170 (42.5%) patients was 2000–5000 Saudi riyals, 283 (70.8%) patients were unemployed/housewives, 303 (75.8%) patients were non-smokers, and 138 (34.5%) patients had a history of a chronic illness. Sociodemographic characteristics for each patient group are presented in [Table 1](#). Among all the patients, 155 (38.75%) patients were willing to undergo BR. The mean age difference between group 1 and group 2 ( $46.04 \pm 8.79$  versus  $53.57 \pm 11.54$ ) was statistically significant ( $P < 0.001$ ). Most of those in group 1 were premenopausal (65.8%), whereas, in group 2, most of the women were postmenopausal (56.3%,  $P < 0.001$ ). There were statistically significant differences observed in occupation ( $P = 0.001$ ) and smoking status ( $P = 0.033$ ) between the two groups, as presented in [Table 1](#). Nevertheless, household income was not associated with a woman's willingness to undergo BR ( $P = 0.365$ ). The frequency of chronic diseases among group 1 was much lower (24.5% versus 40.8%) than among group 2 ( $P = 0.001$ ) ([Table 1](#)). The most prevalent chronic disease among all the patients was diabetes (23.5%).

Most patients in group 1 were diagnosed with BC during the preceding year. For group 2, the highest percentage had been diagnosed with BC between the last year and five years later ( $P < 0.001$ ). The frequency and percentage

**Table 1. Baseline Characteristics of all Patients: Group 1 and Group 2 (n = 400)**

Characteristics	All Patients N (%)	Group 1 (Patients Willing to Undergo BR) (n = 155), N (%)	Group 2 (Patients Unwilling to Undergo BR) (n = 245), N (%)	Odds Ratio	P
Age, y (mean ± SD)	50.65 ± 11.17	46.04 ± 8.79	53.57 ± 11.54	—	<0.001
Nationality				0.636*	0.029
◦ Saudi	164 (41.0)	74 (47.7)	90 (36.7)		
◦ Non-Saudi	236 (59.0)	81 (52.3)	155 (63.3)		
Marital status				—	0.023
◦ Single	47 (11.8)	25 (16.1)	22 (9.0)		
◦ Married	274 (68.5)	106 (68.4)	168 (68.6)		
◦ Divorced	28 (7.0)	12 (7.7)	16 (6.5)		
◦ Widowed	51 (12.8)	12 (7.7)	39 (15.9)		
Menopausal status				0.403*	<0.001
◦ Premenopausal	209 (52.3)	102 (65.8)	107 (43.7)		
◦ Postmenopausal	191 (47.8)	53 (34.2)	138 (56.3)		
Level of education				—	<0.001
◦ Below high school	187 (46.8)	32 (20.6)	133 (54.3)		
◦ High school	66 (16.5)	67 (43.2)	34 (13.9)		
◦ Bachelor's degree	137 (34.3)	2 (1.3)	70 (28.6)		
◦ Master's degree	10 (2.5)		8 (3.3)		
Occupation				—	0.001
◦ Housewife	283 (70.8)	96 (61.9)	187 (76.3)		
◦ Student	4 (1.0)	4 (2.6)	0 (0.0)		
◦ Part time	17 (4.3)	7 (4.5)	10 (4.1)		
◦ Full time	96 (24.0)	48 (31.0)	48 (19.6)		
Household income				—	0.365
◦ <2000 SR	74 (18.5)	22 (14.2)	52 (21.2)		
◦ 2000–5000 SR	170 (42.5)	67 (43.2)	103 (42.0)		
◦ >5000–10k SR	82 (20.5)	32 (20.6)	50 (20.4)		
◦ >10k–20k SR	60 (15.0)	28 (18.1)	32 (13.1)		
◦ >20k SR	14 (3.5)	6 (3.9)	8 (3.3)		
Smoking status				—	0.033
◦ Non-smoker	303 (75.8)	128 (82.6)	175 (71.4)		
◦ Ex-smoker	85 (21.3)	23 (14.8)	62 (25.3)		
◦ Smoker	12 (3.0)	4 (2.6)	8 (3.3)		
History of any chronic illness				0.403*	0.001
◦ No	262 (65.5)	117 (75.5)	145 (59.2)		
◦ Yes	138 (34.5)	38 (24.5)	100 (40.8)		

\* Odds ratios were calculated for dichotomous variables.

of the different treatment modalities and the physicians involved in the treatment plan for both groups have been presented in [Table 2](#).

Group 1 had more knowledge about BR (69.7%) compared with their counterparts (51.4%) ( $P < 0.001$ ). Knowledge about artificial implants and flap tissue method was also observed to be higher among group 1 ( $P < 0.001$ ). Most of the patients had heard about BR from “doctors” while a lesser number had learned about it from an “educational poster.” Only 110 (27.5%) out of the total number of patients had their general surgeons explain to them about BR options, and it was noted that a higher percentage of group 1 received this information (37.4%) compared with group 2 (21.2%) ( $P < 0.001$ ). Body image was important to 78.7% of group 1, whereas it was important for only 40.8% of group 2 ( $P < 0.001$ ).

More participants in group 1 have undergone/will undergo neoadjuvant chemotherapy [83 (53.5%)], adjuvant chemotherapy [139 (89.7%)], and adjuvant radiotherapy [85 (54.8%)] compared with 106 (43.3%), 214 (87.3%), 134 (54.7%) of group 2 respectively ( $P < 0.001$ ). This is shown in [Table 3](#).

The most common reason for unwillingness to undergo BR was that patients did not want additional surgery (31.3%). Further, the most significant reason for

the willingness to undergo BR was to “regain femininity” (26.8%). This is demonstrated in [Figures 1 and 2](#).

## DISCUSSION

Mastectomy is often associated with adverse psychological and functional effects because of this body part's psychological significance. Therefore, women who undergo mastectomy without BR might suffer a decline in their confidence and perception of overall femininity and a change in their attitude in a work-related environment.<sup>25</sup> Undergoing BR after mastectomy plays a significant role in improving the patient quality of life and overall body image.<sup>7</sup> Consequently, in this study, we aimed to assess BC patient perceptions and identify the determinants of patient choices to undergo BR after mastectomy. The rate of undergoing BR after mastectomy differs from one study to another, ranging from 5% to 45%.<sup>26,27</sup> The rate is significantly influenced by different factors such as race, age, and even geographical site.<sup>26,28</sup> The current study results show that a great majority of the women (61%) were unwilling to undergo BR, which is in accordance with a study conducted in 2015 in Saudi Arabia, in which only 16.5% of the patients underwent BR after mastectomy.<sup>14</sup> This can be attributed to the patient- and physician-related factors. In our study, the effect of age on BR is evident

**Table 2. Distribution of BR-related Variables of All Patients**

Variables	All Patients, N (%)	Group 1, N (%)	Group 2, N (%)	P
Time since diagnosed with BC:				<0.001
◦ <1 year	181 (45.3)	90 (58.1)	91 (37.1)	
◦ 1–5 years	175 (43.8)	61 (39.4)	114 (46.5)	
◦ 5–10 years	44 (11.0)	4 (2.6)	40 (16.3)	
Which forms of treatment have you undergone so far/are willing to undergo?*				<0.001
◦ Neoadjuvant chemotherapy	189 (47.25)	83 (53.5)	106 (43.3)	
◦ Surgery	344 (86.0)	141 (91.0)	203 (82.9)	
◦ Adjuvant chemotherapy	226 (56.5)	139 (89.7)	214 (87.3)	
◦ Adjuvant radiotherapy	219 (54.75)	85 (54.8)	134 (54.7)	
◦ Hormonal therapy	164 (41.0)	62 (40.0)	102 (41.6)	
◦ Herceptin (Immunological Tx)	102 (25.5)	38 (24.5)	64 (26.1)	
Do you have any family history of BC?				0.323
◦ Yes	334 (83.5)	133 (85.8)	201 (82.0)	
◦ No	66 (16.5)	22 (14.2)	44 (18.0)	
Which physicians were involved in your treatment plan?*				<0.001
◦ General surgeon	343 (85.75)	139 (89.7)	204 (83.3)	
◦ Plastic surgeon	28 (7.0)	16 (10.3)	12 (4.9)	
◦ Oncologist	260 (65.0)	103 (66.5)	157 (64.1)	
◦ Radiation oncologist	88 (22.0)	30 (19.4)	58 (23.7)	
◦ Psychologist/psychiatrist	6 (1.5)	4 (2.6)	2 (0.8)	

\*Multiple response question.

because the desire for reconstruction is lower in the older age group. Although studies acknowledge BR’s safety in older women, age remains the most reliable negative predictor of undergoing BR.<sup>29,30</sup> This could be explained by the fact that older women may be expected to better deal with physical changes. General surgeons may think that the overall appearance is less important to older women. Furthermore, chronic comorbidities are more common among older women. This can increase the perioperative risk and complications of the surgery, discouraging general surgeons from discussing BR options. In our study, more participants in group 1 have undergone/will undergo adjuvant radiotherapy (85, 54.8%) compared with 134 (54.7%) of group 2 ( $P < 0.001$ ). This could be attributed to the fact

that undergoing this treatment option causes further disfigurement to the breast image, including lymphedema, telangiectasia, skin erythema, and pigmentations, and thus a higher desire to undergo BR.<sup>31</sup> In our study, we found out that group 1 patients were educated about BR on social media at a higher rate (44, 28.4%) than group 2 (40, 16.3%). This could be attributed to the higher educational level of group 1, who tend to search more in multiple platforms for information, including TV [32 (20.6%)], educational posters [4 (2.6%)], and social media [44 (28.4%)], compared with 24 (9.8%), four (1.6%) and 40 (16.3%) in group 2, respectively.

One of the interesting findings in our study was that BC patients who were deciding to undergo BR were medically

**Table 3. Distribution of BR Variables in All Patients**

Variables	All patients, N (%)	Group 1, N (%)	Group 2, N (%)	P
Have you ever heard about “breast reconstruction”?				<0.001
◦ Yes	234 (58.5)	108 (69.7)	126 (51.4)	
◦ No	166 (41.5)	47 (30.3)	119 (48.6)	
If yes, what do you know about “breast reconstruction”?				0.001
◦ I don’t know anything	60 (15.0)	4 (2.6)	6 (2.4)	
◦ Artificial implant	74 (18.5)	38 (24.5)	36 (14.7)	
◦ A flap of tissue from another place on your body	10 (2.5)	46 (29.7)	44 (18.0)	
◦ Both	90 (22.5)	20 (12.9)	40 (16.3)	
Where did you hear about “breast reconstruction”?				<0.001
◦ TV	56 (14.0)	32 (20.6)	24 (9.8)	
◦ Educational poster	8 (2.0)	4 (2.6)	4 (1.6)	
◦ Community activity	12 (3.0)	6 (3.9)	6 (2.4)	
◦ Doctors	114 (28.5)	52 (33.5)	62 (25.3)	
◦ Family member	20 (5.0)	6 (3.9)	14 (5.7)	
◦ Friend	56 (14.0)	22 (14.2)	34 (13.9)	
◦ Social media	84 (21.0)	44 (28.4)	40 (16.3)	
Did your general surgeon explain to you about BR option?				<0.001
◦ Yes	110 (27.5)	58 (37.4)	52 (21.2)	
◦ No	290 (72.5)	97 (62.6)	193 (78.8)	
How important is your body image?				<0.001
◦ Important	222 (55.5)	122 (78.7)	100 (40.8)	
◦ Neutral	118 (29.5)	28 (18.1)	90 (36.7)	
◦ Not important	60 (15.0)	5 (3.2)	55 (22.4)	

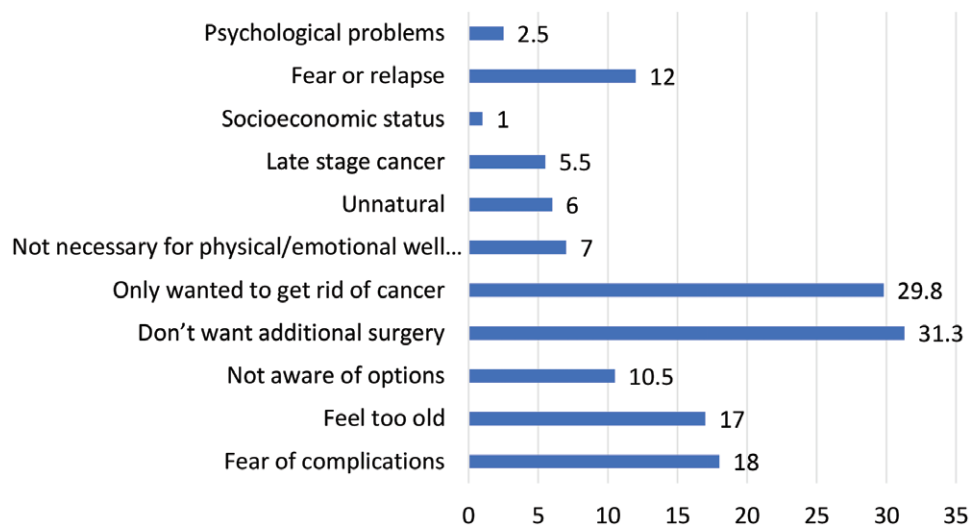


Fig. 1. Reasons behind unwillingness of patients to undergo BR (%).

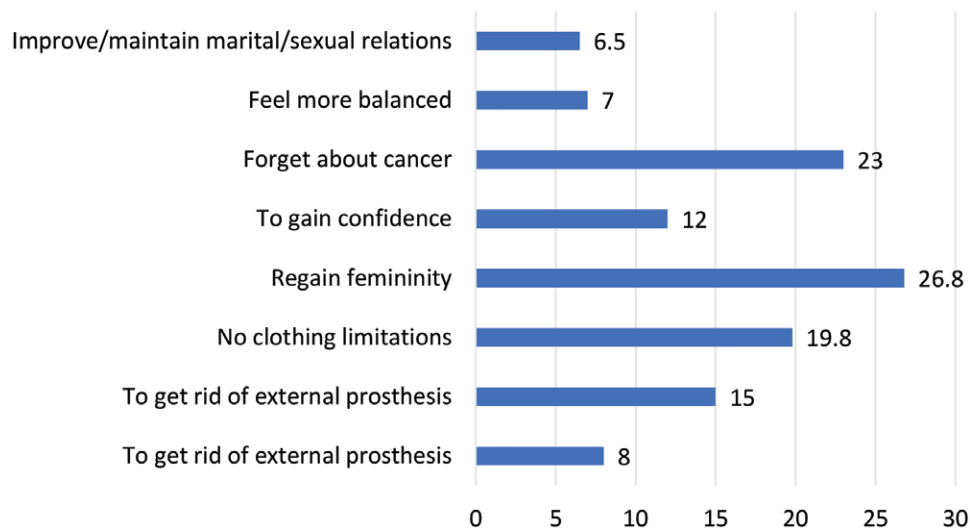


Fig. 2. Reasons behind willingness of patients to undergo BR (%).

free of comorbidities and had no chronic illnesses compared with group 2. This could be explained by the fact that being medically free of other diseases is correlated with a healthier lifestyle, and aiming to undergo the surgery can affect and improve one's quality of life.<sup>32</sup> This finding was in agreement with a previous study conducted in the United States,<sup>33</sup> where patients who were free of other diseases were more likely to decide to undergo BR.

Mastectomy has a negative impact on a woman's body image. Postmastectomy BR has been found to improve the patient's quality of life and her perceived body image.<sup>34,35</sup> In our study, the decision to undergo BR was statistically significant, considering the importance of the patient's body image. Therefore, the self-perception of the body image can be said to be an influencing predictor of the decision to undergo BR. The number of years since diagnosis also had an impact on the patient's willingness to undergo BR. Patients who were diagnosed within a year earlier were more likely to undergo BR. In a

cross-sectional survey involving 1844 patients conducted between 2001 and 2003, Alderman et al found that only 33% of the patients recalled discussing the option of BR after mastectomy with their general surgeons.<sup>19</sup> This study concurs with our results, where only 27.5% of the patients recalled discussing the option of BR with their general surgeons, whereas 37.4% of the patients willing to undergo BR received this information. Our results reveal that doctors were the most common source of information about BR. Therefore, inadequate consideration of BR among general surgeons negatively influences their decision to refer patients to plastic surgeons. Several studies assert a surgeon's influence on a patient's willingness or unwillingness to opt for BR after mastectomy because surgeons are the patient's primary source of information and consultation.<sup>36,37</sup> Knowing the reasons and motivations for a patient to decide to undergo BR can help general surgeons guide their patients in making the appropriate decision. The current study shows that the most common

reason to undergo BR is to “regain femininity” (26.8%), and the most common reason for the unwillingness to undergo BR is that the patients in question did not want an additional surgery (31.3%). This finding is consistent with a survey conducted by Duggal et al.<sup>38</sup> This study offers insights into BC patient perceptions and the determinants of patient choices to undergo BR after mastectomy. Our study demonstrated that 41.5% of women were unaware of their options and decision for undergoing BR after mastectomy. This shows the importance of understanding the availability and the necessity of BR as an option for BC patients by the general surgeons and their referral to plastic surgeons without any assumptions regarding the patient interests in undergoing BR.

### Limitations

The number of total patients was high in our study compared with previous studies with similar objectives.<sup>17,18</sup> Although this study achieved its aims and objectives, it has limitations that must be addressed. First, this study was cross-sectional and covered a limited time period. Therefore, the sample size might not have been an actual representation of the entire population of Saudi Arabia. Second, this study focused on patients from a single hospital, limiting the generalization of the results. In future studies, we recommend involvement of patients from several hospitals in different cities in Saudi Arabia. Also, we recommend using a validated tool to assess body image. Lastly, to fill the literature gap, we advise future studies to assess the perception of BR among women who have undergone BR surgery.

### CONCLUSIONS

The lack of knowledge and misconception about BR is one of the factors preventing BC patients from undergoing BR. Spreading awareness and providing accurate information regarding the procedure will allow women with BC to learn more about postmastectomy reconstruction and thus further encourage them to undergo the BR. It is imperative to standardize the clinical pathway and implement referral patterns to plastic surgeons before mastectomy. Patient ages should not affect physicians' decision on counseling patients about BR.

Hattan A. Aljaaly, MD, FRCSC, MRM

Division of Plastic Surgery, Department of Surgery  
Faculty of Medicine, King Abdul Aziz University  
Jeddah, Saudi Arabia  
E-mail: hattanaljaaly@gmail.com

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