

Enhancing Women's Quality of Life: Exploring the Impact of Mastectomy with and without Breast Reconstruction among Breast Cancer Survivors in Iraq

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Abstract

Background and Aims: Mastectomy, a common intervention for breast cancer, has substantial implications for a woman's quality of life (QoL). However, the literature on QoL outcomes following mastectomy—with or without breast reconstruction (BR) is scant. This study aims to assess and compare the QoL among Iraqi women post-mastectomy, examining the impacts of undergoing BR. **Methods:** We conducted a comprehensive cross-sectional study across multiple centers in Iraq from April to September 2021. Our cohort consisted of 404 women who had a mastectomy for breast cancer treatment, 154 of whom also chose to have BR. Utilizing the European Organisation for Research and Treatment of Cancer's (EORTC) tools specifically, select domains from EORTC QLQ-BR23, QLQ-C30, and QLQ-BRECON23—we evaluated various facets of their QoL. **Results:** The mean QoL score was 54 out of 100, with patients who did not undergo BR reporting slightly higher scores (55) compared to those who did (52). Notably, social and sexual functioning scores were statistically superior in the non-BR group. Satisfaction with surgery, sexual function, and breast aesthetics were the lowest rated aspects among BR patients, indicating a considerable gap between expectations and outcomes. Marital status and the type of mastectomy notably influenced body image and sexual function. A significant portion of patients (100 out of 250) opted out of BR due to recurrence concerns, while 26.2% (106 out of 154) pursued BR to restore their pre-mastectomy physique. **Conclusion:** Contrary to the anticipated benefits of BR, our findings suggest that women who underwent the procedure reported a lower QoL compared to those who did not. The outcomes highlight the discrepancy between expected and actual benefits of BR, suggesting a pressing need for comprehensive rehabilitation programs. These programs should aim to enhance the QoL for post-mastectomy patients and provide in-depth counseling to align expectations with the potential realities of BR.

Keywords: Mastectomy- breast reconstruction- quality of life

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Introduction

Breast cancer is the most common cancer worldwide affecting women globally and, although prognosis is excellent if diagnosed and treated early, treatment can have significant effects on a woman's subsequent quality of life (QoL) [1]. In 2020, there were 2.26 million women newly diagnosed with breast cancer across the world, with the highest incidence rates in Europe [1, 2]. While 90

percent of breast cancer cases are deemed to be curable, about 82.2% of breast cancer patients end up getting a mastectomy while 12.2% opted for lumpectomy in Iraq [3, 4]. Mastectomy is considered an appropriate treatment for cancer-based on a multiplicity of factors such as the failure of past radiation therapy, unavailability of radiation therapy, the size of the tumor, and the potentially high risk of recurrence [5]. While mastectomy is an appropriate breast cancer therapeutic option, its impact on the quality

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of life of the women is significant. Firstly, when women have undergone mastectomy, they often undergo a cycle of emotions stemming from the feeling of mutilation after the procedure [6]. Secondly, this leads to the crucial decision that the patients need to make regarding whether or not to have breast reconstruction if it is offered to them [5].

In Iraq, GLOBOCAN estimates suggest that breast cancer is the most common cancer and cause of cancer-related deaths in women, dominating this cancer profile with 7500 new cases in 2020 (38% of all cancers in women) and causing just over 3000 deaths in 2020. This burden is predicted to double between 2020 and 2040. In this country, prior literature indicates that breast cancer is diagnosed at advanced stages, which leads to a high proportion of women requiring radical mastectomy; they are then offered breast reconstruction surgery (BRS) [7]. The younger population in Iraq, as in many other middle-income countries, means that women with breast cancer who face mastectomy and BRS are much younger than those in Europe [8]. Breast reconstruction (BR) in Iraq occurs but to a lesser extent than neighbouring countries, with much emphasis put on the aesthetic value of this surgery, where some women opt for this surgery to enhance their looks. However, for breast cancer patients in Iraq, BR is not always considered as the women commonly diagnosed are already in their middle to old age and would not opt for this surgery with urgency, especially if they have advanced stages of cancer [4].

Among women undergoing or having had a mastectomy for breast cancer, the decision to undergo breast reconstruction surgery is often undertaken to counter the feelings of regret, decreased sexual function, lower self-esteem, anxiety, and other psycho-social functions [9]. With this in view, about 32.5% of women opt for immediate reconstruction, which is performed at the same time as the mastectomy, while about 6.7% of women opt for delayed reconstruction, which occurs after a period of 6 weeks or even longer [9]. Between these two groups of women, the effect that mastectomy has on their quality of life is evident, with breast reconstruction patients reporting an improved quality of life than those who have not performed any reconstruction in the United States [10]. There are studies that have investigated the effects of mastectomy with or without breast reconstruction (BR), and these studies have yielded divergent views. Despite the high incidence of mastectomy, therefore, it is essential to probe into how QoL of these patients is affected despite their decision to either have or forego BR. BR is often undertaken with the expectation of restoring body image together with emotional, social, and sexual function, but this does not always occur as anticipated, which raises the question of how this surgery would impact the QoL of patients in comparison with the patients who forego it. Therefore, this study aims to meticulously explore and quantify the comparative effects of undergoing mastectomy with and without subsequent BRS on their QoL. Recognizing the significant gap in the existing literature, especially within the context of Iraq an underrepresented country our research seeks to dissect the multifaceted dimensions of post-mastectomy QoL. We examined not only the physical aftermath but also the

psychological, social, and sexual well-being of women post-surgery. By providing a comprehensive analysis of these aspects, our research endeavours to offer vital insights that could guide patient counselling, decision-making regarding BRS, and the development of targeted interventions aimed at enhancing the overall well-being of breast cancer survivors. Ultimately, the findings from this study are expected to contribute significantly to the body of knowledge on breast cancer treatment outcomes in Iraq and similar contexts, thereby informing both clinical practice and policy-making to better support the needs of women navigating this challenging journey.

Materials and Methods

Study Design and Setting

This study employed an observational cross-sectional design to investigate the quality of life (QoL) of women who had undergone mastectomy for breast cancer treatment. The research took place in multiple private oncology clinics across different states in Iraq between April and September 2021. Iraq was selected as the study setting for several reasons. Firstly, breast cancer is a significant health issue in Iraq, with it being the most common cancer and a leading cause of cancer-related deaths among women. The burden of breast cancer in Iraq is expected to double in the coming years. Therefore, studying the quality of life of women with breast cancer in Iraq is crucial to address the specific challenges and needs of this population [11]. Secondly, the rates of mastectomy in Iraq are increasing, particularly in early breast cancer cases. This trend is similar to what has been observed in other countries in the Middle East region. By conducting the study in Iraq, it provides an opportunity to explore the impact of mastectomy and breast reconstruction on the quality of life of women in this specific cultural and healthcare context [12].

Study Population and Sample Size

The participants were recruited during their follow-up appointments at the respective clinics. The inclusion criteria consisted of adult women who had been diagnosed with breast cancer and had undergone a mastectomy, either with or without breast reconstruction, at least one month prior to the study. This time frame was chosen to ensure that the patients had sufficiently recovered from the mastectomy surgery and were experiencing changes in their quality of life due to the breast cancer diagnosis. Women below 18 or above 75 years of age, those with a life expectancy of less than a year as evaluated by specialists, individuals with cognitive or mental diseases, and those unable to communicate in the Arabic language were excluded from the study.

To determine the appropriate sample size, assumptions were made based on a 50% response rate, considering the lack of previous similar studies conducted in Iraq. The Raosoft® sample size calculator was utilized, employing a margin of error of 5%, a confidence interval of 95%, an estimated population size of approximately 700 mastectomies out of 4,115 breast cancer cases in Iraq, and an expected response rate of 50%. The minimum required

sample size was determined to be 249 participants. To account for potential bias in the responses and ensure adequate statistical power, a larger sample of 404 patients was recruited for the study.

Study Instruments

The study employed three questionnaires developed by the European Organisation for Research and Treatment of Cancer (EORTC). These questionnaires were translated into the Arabic language and validated by the EORTC Quality of Life Group. The first questionnaire used was the EORTC QLQ-BR23, a disease-specific module for breast cancer. It consisted of three functional scales: body image functioning (4 items), sexual functioning (2 items), and future health function/future perspective (1 item). The scales and items were evaluated using a Likert scale with four response levels, ranging from 1 (not at all) to 4 (very much).

The second questionnaire utilized was the EORTC QLQ-C30 (version 3), designed to assess the quality of life of cancer patients. From the five available functional scales, three were selected for this study: emotional functioning (4 items), cognitive functioning (2 items), and social functioning (2 items). The Likert scale was used to rate the scales and items, ranging from 1 (not at all) to 4 (very much).

The third questionnaire employed was the EORTC QLQ-BRECON23, which is a breast reconstruction module intended to be used alongside the EORTC QLQ-C30 and QLQ-BR23 in women diagnosed and treated for breast cancer before and after mastectomy and undergoing all types of breast reconstruction. This questionnaire included three functional scales: satisfaction with breast cosmetic (6 items), satisfaction with surgery (3 items), and sexual functioning (4 items). The Likert scale was used to assess these scales and items, ranging from 1 (not at all) to 4 (very much).

Additionally, the questionnaire collected information on participants' demographics, stage of disease, level of education, presence of comorbidities, type of surgery and adjuvant therapies received, and the type of breast reconstruction performed, if applicable.

Data Collection Procedure

Participants were selected using non-probability convenience sampling. Before being invited to participate voluntarily, all potential participants were provided with detailed information about the study's objectives and assured of the confidentiality and anonymity of their responses. Informed consent was obtained from those willing to participate, and participants were given an anonymous questionnaire to complete.

The participants were divided into two groups: Group I consisted of women who had undergone mastectomy without breast reconstruction, while Group II included women who had undergone mastectomy with breast reconstruction. Group I completed the demographic section, EORTC QLQ-BR23, and EORTC QLQ-C30 questionnaires. Group II completed the same sections as Group I, as well as the EORTC QLQ-BRECON23 questionnaire.

Data Analysis

The collected responses from the questionnaires were encoded and analyzed using IBM Statistical Package for the Social Sciences (SPSS) software version 27.0. Descriptive and inferential statistical methods were employed to examine the data and draw conclusions. Descriptive statistics, such as numbers, percentages, means, and standard deviations, were used to summarize the variables. The Kolmogorov-Smirnov test was utilized to determine the shape of the distribution for inferential data. Homogeneity among the participants was confirmed using Levene's test, assuming equal variances when the p-value was greater than 0.05.

To assess the QoL of women after mastectomy with and without breast reconstruction, the resulting scores developed by the EORTC Quality of Life Group were utilized. These scores ranged from 0 to 100 and corresponded to the functional scales in various domains, including body image functioning, sexual functioning, future perspective, emotional functioning, cognitive functioning, social functioning, satisfaction with breast cosmetics, satisfaction with surgery, and sexual functioning. Higher scores indicated better functioning or satisfaction and, consequently, a higher quality of life.

Statistical significance was determined using a significance level of 0.05 and a 95% confidence interval. Independent t-tests and ANOVA tests were conducted to identify any discrepancies between the patients' functional scales and demographic characteristics.

Results

Sociodemographic characteristics

There were 567 patients who met the inclusion criteria; however, only 415 (73 %) of patients agreed to participate in the study. During the study, 7 patients withdrew their approval to participate, and 4 questionnaires were not correctly completed; thus, the number of participants was decreased to 404 (response rate: 71%). The mean age of patients was 50.8, and the majority of them were of Arab ethnicity (67.3%), and over half of the respondents were married (66.3%). Just over half of the women's education level is below a university degree (53.0%) and had an average income level (77.7%). Nearly a third of the respondents (28.7%) had a delayed reconstruction, while almost a tenth of the respondents had an immediate reconstruction (9.4%). While about a quarter of the respondents avoided breast reconstruction due to fear of a tumor reoccurrence (24.8%), only a minority of them have undertaken breast reconstruction due to societal reasons (3.5%), while just over a quarter of the respondents were driven by the desire to feel the same as before the intervention (26.2%). Almost all of the women have undergone neoadjuvant or adjuvant chemotherapy (95.0%) while the remainder have had no chemotherapy at all (5.0%). Over half of the respondents have not undertaken breast reconstruction (61.9%), while the remainder of the respondents (38.1%) have had their breast reconstruction for more than 6 months (78.7%), as shown in Table 1.

Table 1. Sociodemographic Characteristics of Participants with and without Breast Reconstruction (n=404)

Characteristics	Frequency (percentage); n (%)
Age: Mean \pm SD = 50.83 \pm 8.277	
Race	
Arabic	272 (67.3)
Kurdish	78 (19.3)
Others	54 (13.4)
Marital Status	
Single	38 (9.4)
Married	268 (66.3)
Divorced	52 (12.9)
Widowed	46 (11.4)
Education Level	
Below university degree (uneducated-primary-secondary)	214 (53.0)
University degree (Bachelor, Master, PhD)	190 (47.0)
Monthly Income	
Low	60 (14.9)
Average	314 (77.7)
High	30 (7.4)
Co morbidities	
None	182 (45.0)
1	144 (35.6)
2 or more	78 (19.3)
Breast Cancer Stage	
0	6 (1.5)
I	164 (40.6)
II	154 (38.1)
III or more	64 (15.8)
Not sure	16 (4.0)
Type of Surgery	
Total mastectomy	194 (48.0)
Skin-sparing mastectomy	198 (49.0)
Nipple-sparing mastectomy	12 (3.0)
Chemotherapy	
No chemotherapy	20 (5.0)
Neoadjuvant or adjuvant chemotherapy	384 (95.0)
When was mastectomy done?	
Within 6 months from now	86 (21.3)
More than 6 months from now	318 (78.7)
Have you done breast reconstruction?	
Yes	154 (38.1)
No	250 (61.9)
Reasons to avoid breast reconstruction (n=250)	
Fear of tumor recurrence	100 (24.8)
Fear of the intervention of complications	62 (15.3)
Reconstruction not proposed	32 (7.9)
Advanced Age	56 (13.9)

Table 1. Continued

Characteristics	Frequency (percentage); n (%)
If you did breast reconstruction, when was it? (n=154)	
Immediately after mastectomy	38 (9.4)
After a period of time from mastectomy	116 (28.7)
Reasons to proceed with breast reconstruction (n=154)	
Desire to feel the same as before intervention	106 (26.2)
Aesthetic reasons	34 (8.4)
Social Reasons	14 (3.5)

Table 2. The Quality of Life Domain Scales between Mastectomy with and without Breast Reconstruction

QoL sub-dimensions	Without BR (Mean \pm SD)	With BR (Mean \pm SD)	P value
Emotional Function (EF)	44.6 \pm 4.5	44.1 \pm 4.4	0.003*
Cognitive Function (CF)	75.7 \pm 7.6	75.7 \pm 7.6	0.12
Social Function (SF)	54.5 \pm 5.4	51.0 \pm 5.1	<0.01*
Body Image (BI)	61.6 \pm 6.2	61.6 \pm 6.2	0.166
Sexual Function (SeF)	65.3 \pm 6.5	52.8 \pm 5.3	0.006*
Future Perspective	28.0 \pm 2.8	29.0 \pm 2.9	0.001*
Total QoL	54.9 \pm 5.5	52.3 \pm 5.2	0.03*

BR, Breast Reconstruction; *Statistically significant value (p<0.05)

Quality of life of women with and without breast reconstruction

The results indicate that the patients without BR have higher QoL domains in all the sub-dimensions except for the future perspective sub-dimension, where those with BR have a higher score (29.0), as shown in Table 2. The other sub-dimensions which were measured are Emotional Function, Cognitive Function, Social Function and Body Image. The overall QoL score for mastectomy patients without BR is higher (54.9) than those with BR (52.3). The largest difference between the domains of patients with and without BR is in the Sexual Function domain (without BR: 65.3 vs. with BR: 52.8).

Furthermore, mastectomy patients with and without BR reported a total QoL score of 54 with the highest sub-dimension being their cognitive function (75.7) and

Table 3. Overall Quality of Life (QoL) of the 6 Domains of the Mastectomy Patients with and without Breast Reconstruction (n=404)

Domain	QoL Score
Cognitive function	75.7
Emotional function	44.5
Sexual function	60.5
Social function	53.2
Body image	60
Future perspective	28.4
Total QoL	54

Table 4. Quality of Life Domains of Patient who Did Breast Reconstruction (n=154)

Domain	Score
Total QoL Score	36.2
Satisfaction with Surgery	38.5
Sexual Functioning	35.5
Breast Cosmetics	34.5

the lowest sub-dimension being their future perspective (28.4). The other sub-dimensions which were measured are sexual function (60.5), social function (53.2), and emotional function (44.5), as shown in Table 3.

Quality of life of women with breast reconstruction

Table 4 indicates that despite undergoing breast reconstruction surgery, the women still have a low score on the improvement of their overall quality of life, with a total QoL score of 36.2. The respondents indicate the most satisfaction with their surgery (38.5); followed by sexual functioning (35.5) and lastly with their breast cosmetics (34.5).

Difference between the quality of life domains and several variables

There is a statistically significant difference between patients' cognitive function and co-morbidity disease together with chemotherapy. Patients with none comorbidity diseases (79.8) and who have had neoadjuvant/ adjuvant chemotherapy (76.0) have a higher cognitive function. Patients who have performed nipple-sparing mastectomy (86.1) and those with Stage 0 Cancer (88.9) reflected having higher social function than those who had opted for skin-sparing mastectomy (51.3) and have Stage III or more cancer (51.5). It is observed that body Image is higher among Kurdish women (63.0), widowed women (73.2), and those who have performed nipple-sparing mastectomy (84.7), while it is lowest for married women (58.5) and those who have had skin-sparing mastectomy (58.4). Sexual function was noted to be lower for patients who have had a mastectomy for over 6 months (60.2), skin-sparing mastectomy (55.2), and married women (53.7). The significant difference between the quality-of-life domains and sociodemographic characteristics of patients is recorded in Table 5.

Discussion

This study reflects the prevalence of mastectomy as a means of treating and preventing the further occurrence of breast cancer among patients. Among the patients who have opted for a mastectomy, most of our participants have resorted to skin-sparing mastectomy, where the entire breast tissue is removed, and the patient is left nursing a scar with none of the breast tissue remaining. This form of mastectomy is often severe as it leaves the patient with visibly no breast tissue at all which would be noticeable. This is reflected in the studies of Salibian et al. (2021), which indicate that mastectomy is on the rise, and this is largely driven by the patients' perception of the

Table 5. Significant Difference between the Quality-of-Life Domains and Socio-Demographic Characteristics of Patients

Variables	Mean	P value
Cognitive Function		
Comorbidity disease		0.003*
None	79.8 ± 8.0	
1	69.7 ± 7.0	
2 or more	77.4 ± 7.7	
Chemotherapy		0.023*
None	70.0 ± 7.0	
Neoadjuvant/adjuvant chemotherapy	76.0 ± 7.6	
Social Function		
Comorbidity disease		<0.01*
None	59.2 ± 5.9	
1	46.8 ± 4.7	
2 or more	51.3 ± 5.1	
Breast Cancer stage		0.004*
0	88.9 ± 8.9	
I	51.8 ± 5.2	
II	52.4 ± 5.2	
III or more	51.5 ± 5.2	
Type of surgery		<0.01*
Total mastectomy	53.1 ± 5.3	
Skin-sparing mastectomy	51.3 ± 5.1	
Nipple-sparing mastectomy	86.1 ± 8.6	
Body Image		
Race		0.046*
Arabic	62.8 ± 6.3	
Kurdish	63.0 ± 6.3	
Others	54.0 ± 5.4	
Marital status		<0.01*
Single	71.5 ± 7.2	
Married	58.5 ± 5.9	
Divorced	60.8 ± 6.1	
Widowed	73.2 ± 7.3	
Type of surgery		<0.01*
Total mastectomy	63.6 ± 6.4	
Skin-sparing mastectomy	58.4 ± 5.8	
Nipple-sparing mastectomy	84.7 ± 8.5	
Sexual Function		
Marital status		<0.01*
Single	75.4 ± 7.5	
Married	53.7 ± 5.4	
Divorced	69.2 ± 6.9	
Widowed	78.3 ± 7.8	
Type of surgery		<0.01*
Total mastectomy	63.9 ± 6.4	
Skin-sparing mastectomy	55.2 ± 5.5	
Nipple-sparing mastectomy	94.4 ± 9.4	
Mastectomy date		0.049*
Within 6 months	62.0 ± 6.2	
More than 6 months	60.2 ± 6.0	

*Statistically significant value (p<0.05)

treatment of breast cancer [13]. With these circumstances, the consideration of breast reconstruction surgery is highly considered by the patients as they would seek to compensate for their appearance and avoid garnering attention from people and also improve how they feel about themselves.

This study reflected that one of the main motivations of undergoing breast reconstruction is the need for patients to feel how they did before the intervention. Patients would seek to restore their levels of confidence, body image, and sexual function, which would have declined due to breast mutilation. Therefore, patients would consider both immediate and delayed breast reconstruction, which would help them achieve their goals of restoring their declined functions. Additionally, this study found that breast reconstruction is undertaken by the need to improve aesthetics, where the patients feel that they would improve their appearance and they can maintain a good quality of life. These findings are consistent with the study of Turk & Yilmaz (2018) and Ng et al. (2019), which asserts that the primary reasons for undertaking BR stem from the need to regain and recover decreased functions which are a result of the mastectomy [14, 15]. The functions that are anticipated to recover are commonly body image, sexual function, and emotional fulfillment. Thus, the patients would have a high level of expectation as they begin their BR journey.

While the decision to undertake BR is based on anticipated benefits and improved quality of life, our findings showed that patients who have BR are often less pleased with their results than expected, thus noting a minor improvement in their QoL. This present study documented that the patients who have BR surgery have low levels of satisfaction with the breast cosmetics. The results that the patients get will be far less impressive than what they anticipate as they decide to do the surgery. This can be caused by the higher expectation of the patients, which the surgeons might not always fulfill because body parts that have been surgically modified will always have a different appearance from those that have not. A patient would still prefer their lost breast over the reconstructed breast, as the texture, shape and sensation would be altered too [16, 17]. To rationalise this, one can allude to the study of Shamma et al. (2021) which finds that the low levels of satisfaction stem from the patient's comparison with their old breast rather than reflecting the ability of the surgeon [16]. Additionally, this study finds that these patients have low levels of satisfaction with their sexual functioning and with the surgery as a whole; reflecting that some patients would even regret doing the BR surgery. For example, some patients might struggle to reveal to their partners that they have reconstructed breasts which would affect their sexual function as they would be uncomfortable with disclosing such information to another person. This is reflected in the study of Shamma et al. (2022) which discusses that satisfaction after BR is rarely achieved because after mastectomy a patient's perception of their body takes a very long time to recover and that might not even happen [18]. The patient would struggle to come to terms with their new appearance and despite having BR surgery they might still have fear of tumour reoccurrence

and that would cause multiplicity of negative emotions.

While our results showed that patients which have had BR surgery have less satisfaction with their results, this study also finds that they have lower QoL domains than patients who have not performed any BR surgery. While this might be contrary to expectations, patients who just have their mastectomy and then live without any further BR surgery reported having a slightly higher quality of life in most of the QoL domains. Firstly, patients without BR reported having higher emotional function than those with BR, which reflects the emotional nature of the process of having BR. When one has BR they open up another dimension of issue to deal with which might take a toll on their emotions. This can be explained by the study of Zehra et al. (2020) and Stein et al. (2020) which highlights that patients having BR often worry about how well their surgeon will reconstruct their breast, how they will feel after their surgery, how people around them will perceive them and more commonly; whether or not they will have any future reoccurrence of the tumour [9, 19]. Therefore, these considerations would take an emotional toll on the patient with BR and these concerns would not fade away over time but might even intensify and become more complex. On the other hand, patients without BR mainly have to deal with their mastectomy wounds and way to care for themselves after their surgery and this takes an often-lighter emotional toll on them. This is reflected in the study of Teo et al. (2018) which finds that patients who decide to forego BR would often come to terms with their new reality and live more emotionally fulfilling lives without having to deal with the extra toll which BR patients endure [20].

Patients without BR scored a higher Sexual Function than those with BR, which reflects how BR surgery significantly affects the sexual wellbeing of the patients. As highlighted before, patients with BR are often left unsatisfied with the surgery and would typically have more fear over possibly having further complications with their breast or breasts, which would limit their flexibility and rarely leave them at ease. While patients with BR have their breasts reconstructed to have an even better appearance than before the surgery it is apparent that this does not bring much fulfilment. This does not greatly improve their sexual function, which is rationalised in the study of Archangelo et al. (2019), which holds that sexual function is not largely improved by physical appearance but rather it is driven by the internal perceptions of the individual [21]. This also supports how people without BR have a higher sexual function as the common trend which has been noted among these patients is quicker acceptance of their new reality and the confidence which they have in themselves despite having had mastectomy. Additionally, sexual function is noted among the patients who would have had nipple-sparing mastectomy rather than skin-sparing mastectomy. Therefore, this highlights that patients would be better off with having nipple-sparing mastectomy which would still help them retain confidence and sexual functionality, rather than opting for BR which would still leave them largely unsatisfied [22, 23].

Additionally, our study demonstrated that patients

without BR often have higher social function than those with BR, which highlights the social impact of issues surrounding BR surgery. It is evident that society still has not fully adapted to the concept of BR surgery due to several reasons. For example, BR surgery might be considered as mainly driven by aesthetics and by the need to increase attraction of male attention; which is frowned upon in conservative societies [24]. This deters women who live in conservative societies from having BR surgery despite having slight interest to do so [25]. These patients would consider how they might be negatively viewed in their society when others know that they have done BR surgery and then decide to just avoid it. As a result, such patients would feel good as they would be compliant with societal expectations and maintain a modest appearance. On the contrary, patients with BR are faced with multiple social dilemmas stemming from their BR surgery. For example, these patients would struggle with deciding whether or not to disclose having BR surgery and the opinions which would follow thereafter. This is consistent with the study of Sousa et al. (2019) which reported that the social dilemmas faced after BR often lead patients to regret having the surgery and also struggling to interact with people in society whom they feel might negatively judge them for making such a decision [26].

Without considering having BR surgery or not, body image is a prevalent issue among women of all ages and health conditions. However, body image issues often become emphasized when one has had health complications which involve drastic measures such as mastectomy. This leads the people to looking for ways in which they can cover up their imperfections in the hopes of improving their body image; yet this objective is never fully achieved and instead commonly has the opposite effect. Previous studies documented that people who accept their physical conditions and embrace themselves without having to consider any other cosmetic procedures often have higher levels of body image than those who perform cosmetic surgery [27, 28]. The current study found that patients without BR having a more positive body image, and according to Olasehinde et al. (2019), this stems from their acceptance of their condition and emphasis on having a healthy body rather than an attractive body [29]. On the other hand, patients with BR would still struggle with body image as they would be worried if people might notice any difference with their breasts, how the breast tissue might change over time and whether this would leave them with a bad appearance; which would drive a negative body image and might lead to extreme cases of body dysmorphism [30].

It is common to note that when patients undergo surgery, their cognitive functions are affected [31]. This study also found that patients with two or more co morbidities and without any chemotherapy treatment often have lower cognitive function after mastectomy. This highlights that the QoL which patients have after they have mastectomy is dependent on the other health issues which they might have and when one has more health complications their QoL would decline further. A previous literature reported that breast cancer patients would have already been affected by their health conditions and

when they have mastectomy their health condition would continue to decline, as this would take a toll on their overall well-being [31].

Limitation

This study is limited by the number of participants with BR, where the majority of the respondents have not had BR surgery after their mastectomy. Therefore, it is recommended to have a larger sample size with more patients who have BR as this would help in developing greater insights into their QoL without being overshadowed. Additionally, it is recommended for future studies to investigate other factors that may play role in affecting the quality of life of patients after mastectomy with and without breast reconstruction.

In conclusion, our findings indicate that patients forgoing breast reconstruction (BR) report a higher quality of life (QoL) than those opting for BR, suggesting a gap between expected and actual surgery outcomes. To address this, clinical practice must evolve to include thorough pre-surgical counseling, offering realistic outcome expectations and potential risks to ensure informed decision-making. Moreover, integrating psychological support and physical rehabilitation into post-mastectomy care can significantly enhance overall recovery and well-being.

Policy-wise, these insights call for the establishment of comprehensive care frameworks that encompass mental health services, patient education, and community support, facilitating a holistic approach to breast cancer survivorship. Additionally, policy initiatives should focus on improving BR techniques and outcomes through continuous research and quality improvement efforts.

In essence, improving QoL post-mastectomy requires informed patient choices, multidisciplinary support, and policy-driven enhancements in breast cancer care. These steps are crucial for meeting the diverse needs of survivors, whether they choose BR or not.

Author Contribution Statement

BARH and AHM started the research idea and designed the study; BARH, Abeer AA, Alya AA, AZAA, MKA carried out the data collection. AHM drafted the manuscript. AHM, AMW, JJ, and BARH reviewed and edited the drafted study. All Authors state that they had complete access to the study data and approved the submission of the present version of the manuscript and takes full responsibility for the manuscript.

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Ethical statement

All procedures performed in this study were in accordance with the ethical standards of the institutional research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. The Institutional Research Ethics Committee of Al Rafidain University College granted the ethical approval for this study (EC-69-2021; 1st April 2021).

Consent to participate

Informed consent was obtained from all individual participants in the study.

Consent to publish

Participants signed informed consent regarding publishing their de-identified data.

Availability of Data and Materials

Data and other materials are available upon request from the corresponding authors.

Conflict of interest

The authors declare that there is no conflict of interest.

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