

# ONCOPLASTIC SURGERY AND IMMEDIATE BREAST RECONSTRUCTION IN BREAST CANCER PATIENTS: SATISFACTION AND QUALITY OF LIFE EVALUATION

Cirurgia oncoplástica e reconstrução mamária imediata em pacientes com câncer de mama: avaliação da satisfação e qualidade de vida

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## ABSTRACT

**Objective:** Oncoplastic surgery and breast reconstruction represent an advance in breast cancer surgeries, combining oncologic resection with plastic surgery techniques, and enabling optimal cancer treatment, good esthetic results, and improvement in patients' quality of life. The objective of this study was to evaluate the satisfaction and quality of life of patients submitted to surgical treatment of breast cancer through oncoplastic surgery and breast reconstruction techniques. **Methodology:** Cross-sectional study with women undergoing surgical treatment of breast cancer through oncoplastic and/or breast reconstruction techniques, treated in the mastology center of the Federal District, from December 2016 to May 2017. The research instrument employed to assess satisfaction and quality of life was BREAST-Q. Data analysis adopted Student's t-test or the Mann-Whitney test and simple linear regression to evaluate the relationship between age and the outcome investigated. **Results:** The final sample consisted of 15 women who met the eligibility criteria. The overall mean BREAST-Q score was greater than 54.2 for satisfaction and quality of life indicators. For each year of age, the sexual well-being score increased 0.15 ( $p<0.02$ ); the satisfaction with medical team score, 0.83 ( $p<0.02$ ); and the care satisfaction score, 0.23 ( $p<0.04$ ). **Conclusion:** This study suggests that breast reconstruction improves satisfaction with breast appearance and quality of life in patients treated for breast cancer. Further longitudinal studies are necessary to elucidate the subject better.

**KEYWORDS:** breast neoplasms; mammoplasty; reconstructive surgical procedures; quality of life; patient satisfaction.

## RESUMO

**Introdução:** A cirurgia oncoplástica e reconstrutiva da mama representa um avanço nas cirurgias de câncer de mama e combina ressecção oncológica com técnicas de cirurgia plástica, possibilitando alcançar tratamento oncológico ideal, bons resultados estéticos e melhora na qualidade de vida das pacientes. Avaliar a satisfação e a qualidade de vida das pacientes submetidas ao tratamento cirúrgico do câncer de mama por meio de técnicas de cirurgia oncoplástica e reconstrutiva da mama. **Metodologia:** Estudo transversal com mulheres submetidas ao tratamento cirúrgico do câncer de mama por meio de técnicas oncoplásticas e/ou reconstrutivas da mama, atendidas no serviço de mastologia do Distrito Federal, no período de dezembro de 2016 a maio de 2017. O instrumento de pesquisa empregado para avaliar a satisfação e qualidade de vida foi o BREAST-Q. Na análise dos dados, foram utilizados os testes t ou Mann Whitney e regressão linear simples para avaliar a relação da idade com desfecho investigado. **Resultados:** A amostra final foi composta de 15 mulheres que preencheram os critérios de elegibilidade. A pontuação média global no BREAST-Q foi superior a 54.2 para os indicadores de satisfação e qualidade de vida. Observou-se que para cada ano de idade houve um aumento de 0.15 no escore de bem-estar sexual ( $p<0.02$ ), 0.83 pontos no escore de satisfação com a equipe médica ( $p<0.02$ ) e 0.23 pontos no score de satisfação com o cuidado recebido ( $p<0.04$ ). **Conclusão:** Este estudo sugere que a reconstrução mamária melhora a satisfação com a aparência das mamas e a qualidade de vida nas pacientes tratadas de câncer de mama. É necessário a realização de novos estudos longitudinais que permitam elucidar melhor o tema.

**PALAVRAS-CHAVE:** neoplasias da mama; mamoplastia; procedimentos cirúrgicos reconstrutivos; qualidade de vida; satisfação do paciente.

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## INTRODUCTION

Breast neoplasm is the most common cancer among women worldwide, affecting more than 1.5 million of them annually<sup>1</sup>. In Brazil, it corresponds to approximately 28% of new patients each year, with 59,700 new cases estimated for 2018<sup>2</sup>.

Breast cancer is a chronic disease, and genetic and epigenetic events can result in the multiplication of abnormal cells, forming a tumor with different behavior patterns and therapeutic responses<sup>3</sup>.

Surgical treatment of breast cancer has made great strides over the years, with aggressive and mutilating surgeries giving way to conservative treatments, due to their association with radiotherapy and overall and disease-free survival rates being similar to mastectomy rates. Since the '80s, this treatment incorporated breast plastic surgery techniques, aiming to improve esthetic and functional results in the breast<sup>4-6</sup>.

The patient affected by this disease must be thoroughly evaluated. The therapy adopted, surgical or non-surgical, should aim to reduce morbidity and mortality, as well as improve the physical and psychological well-being of patients<sup>7,8</sup>. Surgical interventions associated with breast cancer treatment can have a negative impact on the patient's personal satisfaction and quality of life, often manifested through anxiety, shame, significant mood disturbances, decreased sexual interest, and depression<sup>7,8</sup>.

Several studies affirm that oncoplastic surgery has a positive result regarding efficacy and quality of life of women with breast cancer, including favorable esthetic outcomes<sup>9-11</sup>.

Immediate breast reconstruction has become an integral part of breast surgery, improving postoperative quality of life and mitigating deleterious effects. This procedure can help patients restore their body image and promotes physical and psychological well-being, in addition to being considered oncologically safe<sup>12-14</sup>.

Oncoplastic surgery and breast reconstruction play an important role in the management of breast cancer. Estimates indicate that more than 95,000 breast reconstructions are performed annually worldwide<sup>15</sup>. In Brazil, only 10% of the patients submitted to mastectomy have access to immediate breast reconstruction<sup>16</sup>.

Al-Ghazal and Schain evaluated the impact of immediate breast reconstruction on quality of life and concluded that patients who undergo this type of surgery are less predisposed to suffer from psychological disorders<sup>14,17</sup>.

Understanding the effects that breast cancer treatment can have on the physical and psychological well-being of patients affected by the disease is determinant in guiding care and search strategies that can minimize psychological imbalance and increase acceptance of body image. Nonetheless, we found no studies on the topic in the Federal District. This study aimed to evaluate the satisfaction and quality of life of patients submitted to surgical treatment of breast cancer through oncoplastic surgery and breast reconstruction.

## METHODOLOGY

### Design/population

This is a cross-sectional study with women treated in the mastology center of the Federal District Base Hospital, who underwent surgical treatment of breast cancer through oncoplastic surgery and immediate breast reconstruction from December 2016 to May 2017. The sample size was defined according to the flow of women treated in the institution who needed breast reconstruction. Among the 61 women treated for breast cancer, only 27 (44.26%) underwent breast reconstruction (Figure 1).

The Human Research Ethics Committee of the State Department of Health of the Federal District approved this research under name and registration: Presentation Certificate for Ethical Assessment 61442116.3.0000.5553. All women who participated in the present investigation signed the Informed Consent Form.

### Eligibility criteria

#### Inclusion criteria

We selected female patients of any age diagnosed with primary breast cancer and surgically treated with oncoplastic surgery and immediate breast reconstruction.

#### Exclusion criteria

We excluded patients diagnosed with systemic disease, inflammatory carcinoma, and those submitted to late breast reconstruction; deceased patients; those not found; the ones who did not sign the Informed Consent Form; or who refused to participate in the study.

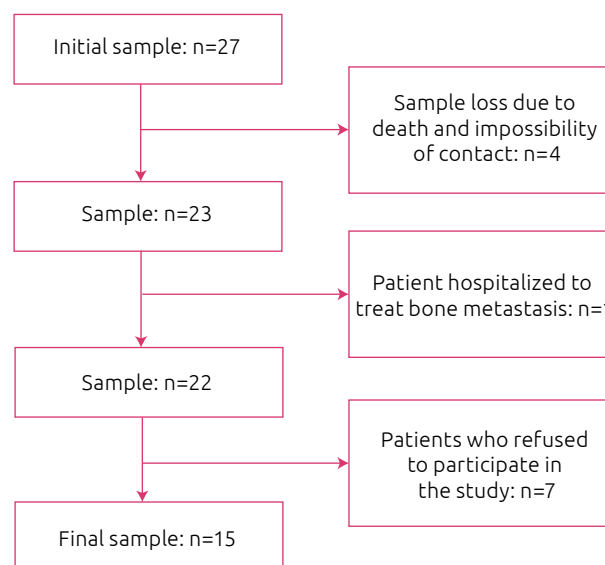


Figure 1. Selection of participants.

### Data collection procedure

Data collection initially consisted of identifying the names of patients submitted to surgical interventions according to eligibility criteria, described in the hospital surgical records. This information allowed us to find them in the electronic medical record.

After identification, we contacted them by telephone to schedule a medical appointment. The patients were invited to participate in the research and those who accepted signed the Informed Consent Form.

During data collection, we applied two questionnaires: sociodemographic and clinical characteristics; and BREAST-Q, a validated instrument with questions related to satisfaction and quality of life. All steps of data collection were individual to ensure the privacy and confidentiality of the participant. We gathered all clinical and anatomopathological data regarding the tumor in the electronic medical record after the interview. Patients who did not visit the ambulatory or did not answer the telephone call were contacted again two weeks after the first try.

### Data collection instrument

The survey was divided into sections:

- Identification and sociodemographic data;
- Clinical variables;
- Treatment-related variables;
- BREAST-Q.

### Criteria to define exposure and outcome

#### Exposure: Oncoplastic surgery and breast reconstruction

Women with primary breast cancer operated on using the following surgical techniques: reconstructive surgery (nipple-sparing mastectomy, skin-sparing mastectomy), volume displacement (glandular rotation, round block, oncoplastic reduction, elevation and centralization of the nipple-areola complex and areola complex) and volume replacement (latissimus dorsi muscle flap or transverse rectus abdominis musculocutaneous flap). This study had no comparison group, so only women who underwent surgical treatment were evaluated.

#### Outcome: Quality of life and patient satisfaction after surgery

We used the validated BREAST-Q to assess quality of life and patient satisfaction. This study applied the postoperative scale of the breast reconstruction module. This module is divided into multiple independent scales: health-related quality of life, including physical, psychosocial, and sexual well-being; patient satisfaction, which involves breast, outcome, and care.

Each patient response was entered into the Q-score software to provide a full scale ranging from 0 to 100 points. We classified quality of life and satisfaction with surgical results according to the score produced, with higher scores representing better satisfaction or quality of life.

### Data analysis procedure

The data collected were transcribed into an Excel spreadsheet for statistical analysis.

First, we performed a descriptive data analysis for categorical variables. Subsequently, we calculated medians, means, and standard deviations for the numerical information; visually inspected histograms; and used the Kolmogorov-Smirnov normality test to evaluate data distribution. Next, we used Student's t-test or the Mann-Whitney test with a 5% significance level, according to the classification of the homogeneity of results. Finally, the beta coefficients and their 95% confidence intervals were determined by simple linear regression using ordinary least squares to estimate the effect of the continuous age variable on satisfaction and quality of life indicators. The model used the  $R^2$  obtained in the analysis above. We performed the data analysis in the statistical package STATA®, version 15 for Windows, serial number: 301506206729 and presented the findings in tables and graphs.

## RESULTS

In total, 61 patients were submitted to surgical treatment of breast cancer during the study period, and only 27 (44.26%) women had their breasts reconstructed. The final sample of this investigation consisted of 15 (24.59%) women who underwent oncoplastic surgery and breast reconstruction and met the eligibility criteria of the study.

Their mean age was 46.73 years ( $\pm 7.16$ ), and the median age was 48 years, ranging from 35 to 60 years. Only 2 (13.33%) patients had not completed elementary school, 9 (60%) had no partners, and 11 (73.33%) had no stable employment (Table 1).

Two (13.33%) women had a family history of breast cancer, 2 (13.33%) were nulliparas, 14 (93.33%) had no diagnosis of diabetes, 12 (80%) had no diagnosis of hypertension, and 14 (93.33%) did not smoke (Table 2).

The most frequent tumor site was the upper outer quadrant, and 10 (66.67%) patients did not have clinically involved axillary lymph nodes. Most participants presented initial clinical staging of the disease. Nine (60%) patients were submitted to neoadjuvant chemotherapy, 9 (40%) to radiotherapy, and 11 (73.33%) to hormone therapy. Two (13.33%) patients could not undergo radiotherapy because they were not within the ideal deadline stipulated for the treatment. Immunohistochemical analysis indicated the molecular subtype luminal B as the most common finding (Table 3).

All cases were diagnosed as invasive ductal carcinoma, and 7 (58.33%) had histological grade 2. Neoadjuvant chemotherapy hindered the histological grade evaluation in three patients. We highlight that most patients underwent mastectomy followed by breast reconstruction, while the others were submitted to oncoplastic breast surgery. All women presented free surgical margins (Table 3).

The most used surgical techniques were nipple-sparing mastectomy followed by mastectomy and latissimus dorsi muscle flap with breast prosthesis. Oncoplastic techniques were preferred for symmetrization.

**Table 1.** Sociodemographic and lifestyle characteristics of women who underwent immediate breast reconstruction, treated in a public hospital in the Federal District, Brazil, 2017 (n=15).

Variables	N	%
Education		
Middle school	6	40.00
High school	6	40.00
College	1	6.67
Incomplete elementary school or with no schooling	2	13.33
Marital status		
Married	3	20.00
Domestic partnership	3	20.00
Single	4	26.67
Divorced	3	20.00
Widow	2	13.33
Occupation		
Stable employment	4	26.67
Informal employment	3	20.00
Not working or working at home	8	53.33

**Table 2.** Health and family history of women who underwent immediate breast reconstruction, treated at a public hospital in the Federal District, Brazil, 2017 (n=15).

Variables	N	%
Family history of breast cancer		
Yes	2	13.33
No	13	86.67
Parity		
Nullipara	2	13.33
Primipara	4	26.67
Multipara	9	60.00
Diabetes mellitus		
Yes	1	6.67
No	14	93.33
Arterial hypertension		
Yes	3	20.00
No	12	80.00
Previous breast surgeries		
Yes	2	13.33
No	13	86.67
Smoker		
Yes	1	6.67
No	14	93.33

**Table 3.** Variables related to cancer diagnosis and treatment in women who underwent immediate breast reconstruction, treated in a public hospital in the Federal District, Brazil, 2017 (n=15).

Variables	N	%
Breast size		
Big	1	6.67
Satisfactory	11	73.33
Small	3	20.00
Breast symmetry		
Yes	7	46.67
No	8	53.33
Desire to reconstruct the NAC		
Not applicable	4	26.67
Yes	11	73.33
Chemotherapy		
Adjuvant	4	26.67
Neoadjuvant	9	60.00
No	2	13.33
Radiotherapy		
Yes	9	40.00
No	6	60.00
Hormone therapy		
No	4	26.67
Yes	11	73.33
Location		
Upper outer quadrant (UOQ)	6	40.00
Upper inner quadrant (UIQ)	3	20.00
UIQ and central portion (CP)	1	6.67
CP	1	6.67
Junction of the lower quadrants (JLQ)/6 o'clock	1	6.67
Junction of the upper quadrants (JUQ)/12 o'clock	3	20.00
Clinical evaluation of the axilla		
Positive	5	33.33
Negative	10	66.67
Type of surgery		
Radical	11	73.33
Conservative	4	26.67
Clinical staging		
1 A	1	6.67
2 A	7	46.67
2 B	3	20.00
3 A	3	20.00
3 B	1	6.67
Histological type		
IDC	15	100.00
Histological grade		
1	3	25.00
2	7	58.33
3	2	16.67
Tumor subtype		
HER2 Hybrid	3	20.00
Luminal A	5	33.33
Luminal B	6	40.00
Triple negative	1	6.67
Surgical margin		
Free	15	100.00
Surgical resurfacing		
No	15	100.00
Early complications		
Yes	6	40.00
No	9	60.00
Surgical technique (cancerous breast)		
Nipple-sparing mastectomy with prosthesis	2	13.33
Skin-sparing mastectomy with prosthesis	5	33.33
Round block	2	13.33
Oncoplastic reduction with superior pedicle	1	6.67
Oncoplastic reduction with inferior pedicle	1	6.67
Latissimus dorsi muscle flap with breast prosthesis	4	26.67
Symmetrization		
Round block	1	6.67
Oncoplastic reduction with superior pedicle	3	20.00
Oncoplastic reduction with inferior pedicle	2	13.33
Breasts unsymmetrized	9	60.00

Less than half had early complications, with seroma (4–26.66%) and dehiscence (2–13.33%) being the main ones. All cases of dehiscence were submitted to additional sutures.

Most women perceived breast size as satisfactory. Nevertheless, more than half of them considered their breasts as asymmetrical. Only 2 (13.33%) participants underwent previous breast surgeries. All patients who had their nipple areola complex amputated expressed a desire to reconstruct it (Table 4).

Regarding satisfaction and quality of life indicators, the overall mean score was greater than 54.2 (Table 4). In the analysis of continuous variables, women presented higher average satisfaction indicators when they did not undergo radiotherapy and did not suffer surgical complications, although this result was not considered statistically significant for the variables assessed.

For each year of age, the sexual well-being score increased 0.15 ( $p < 0.02$ ); the satisfaction with the medical team score, 0.83 ( $p < 0.02$ ); and the care satisfaction score, 0.23 ( $p < 0.04$ ). The variables psychosocial well-being, physical well-being, satisfaction with breast, satisfaction with outcome, satisfaction with information, and satisfaction with surgeon were not statistically significant for the age of the participants (Figure 2).

## DISCUSSION

The main results of this study show that patients submitted to breast reconstruction and oncoplastic surgery techniques present an overall mean score for satisfaction and quality of life higher than 50 points on a scale ranging from 0 to 100.

For many years, satisfaction with the esthetic outcome and quality of life assessment were set aside, and the focus was essentially on the oncological treatment of breast cancer. The breast has always been considered a symbol of femininity and the psychosocial impact of its absence or deformity on the patient started to be highlighted in the treatment of breast cancer<sup>18,19</sup>.

Oncoplastic surgery and breast reconstruction have reached wide acceptance and allow patients to have adequate oncological treatment, with good esthetic results and improvement in their well-being.

Dean & Crittenden assessed pre- and postoperative quality of life in patients submitted to breast reconstruction at different times and observed that it was highly effective in terms of psychosocial, physical, and sexual well-being and the satisfaction with breasts when comparing preoperative scores with those calculated 6 months after the reconstruction<sup>9</sup>.

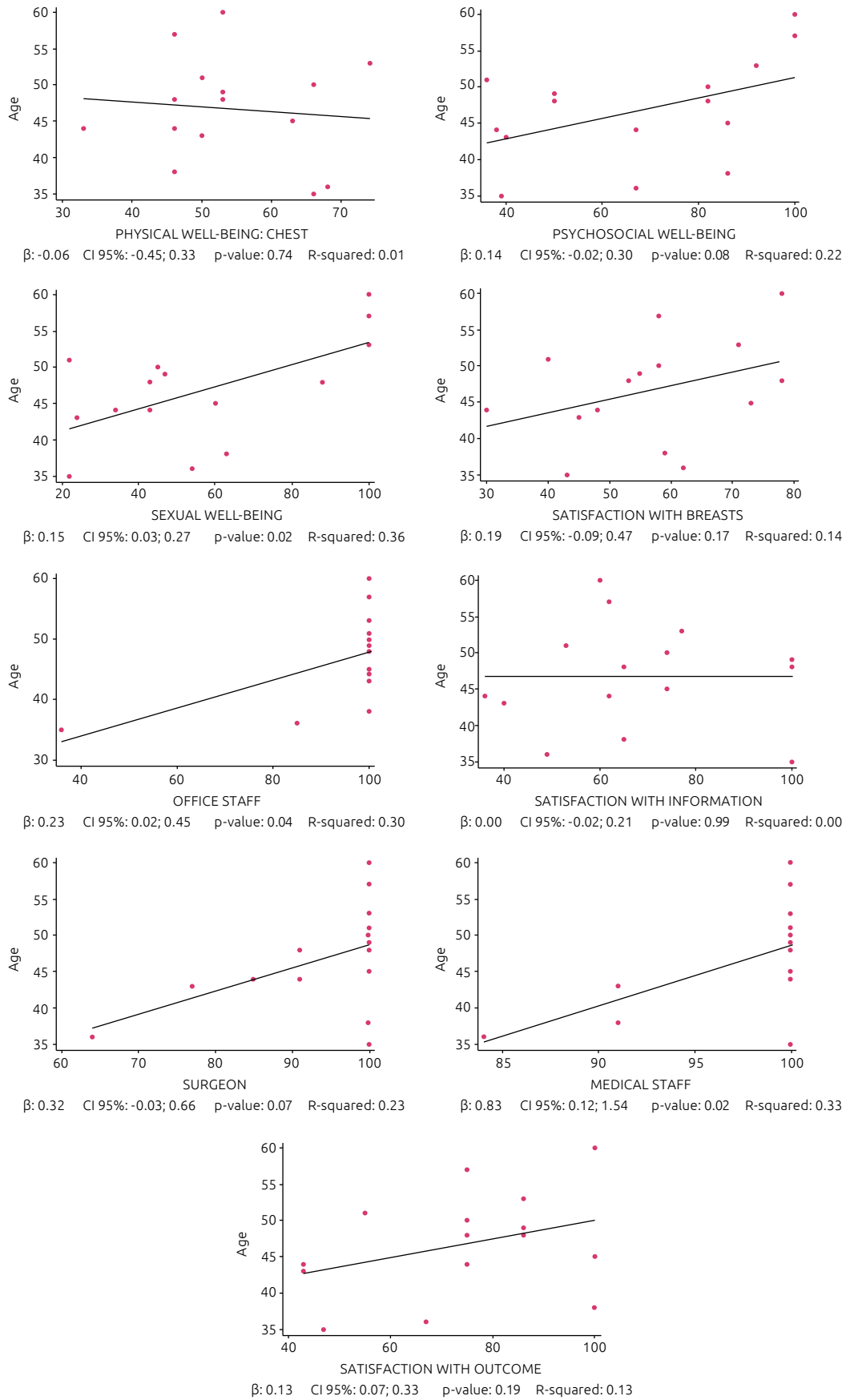
Howes et al. showed that women submitted to immediate breast reconstruction had better indicators of satisfaction with surgical results. Regarding sexual well-being, women who underwent mastectomy with reconstruction reached higher scores when compared to those who had conservative breast surgery or mastectomy without reconstruction<sup>10</sup>. The research by Shekhawat et al. revealed that patients submitted to therapeutic mammoplasty had low scores for sexual well-being<sup>11</sup>.

The study by Shekhawat indicated that breast reconstruction has a positive impact on the quality of life of women undergoing surgical treatment. The authors found that patients not submitted to breast reconstruction presented sexuality-related and psychological issues<sup>11</sup>.

Some studies demonstrated that most patients are satisfied with the surgeon and the information provided by this professional<sup>11</sup>. Susarla et al. evaluated the satisfaction of patients undergoing immediate reconstruction with implants in one or two stages and found that two-stage reconstruction was associated with greater satisfaction with the medical team and office staff<sup>20</sup>. The present research showed that the satisfaction score with the medical team and office staff was high, corroborating the findings of the mentioned studies. The research carried out by Ng et al. indicated results contrary to those presented in this study<sup>21</sup>.

**Table 4.** Measures of central tendency and dispersion of general characteristics and satisfaction and quality of life indicators in women who underwent immediate breast reconstruction, treated in a public hospital in the Federal District, Brazil, 2017 (n=15).

Variables	Median	Mean	Standard deviation ( $\pm$ )	Minimum–maximum
Age (years)	48	46.73	7.16	35–60
Body mass index	25.71	25.92	3.65	20.61–33.09
Physical well-being	53	54.2	11.00	33–74
Psychosocial well-being	67	67.66	23.70	36–100
Sexual well-being	47	56.33	28.36	22–100
Satisfaction with breasts	58	56.73	14.20	30–78
Satisfaction with outcomes	75	74.2	19.86	43–100
Satisfaction with information	65	67.8	20.30	36–100
Satisfaction with surgeon	100	93.87	10.84	64–100
Satisfaction with medical team	100	97.73	4.93	84–100
Satisfaction with care	100	94.73	16.70	36–100



**Figure 2.** Linear regression graphs and satisfaction and quality of life indicators in women who underwent immediate breast reconstruction, treated in a public hospital in the Federal District, Brazil, 2017 (n=15).



Egro et al. found an average breast satisfaction index of 69.8. The immediate reconstruction group had higher satisfaction rates<sup>22</sup>. In our study, the average satisfaction index was 73.69 points for the indicators investigated.

Complication rates in oncoplastic surgeries range from 10 to 60% and include seroma, hematoma, nipple necrosis, infection, wound dehiscence, and late wound healing<sup>22-27</sup>. This investigation found only two of these complications: seroma and operative wound dehiscence.

Patients surgically treated for breast cancer often have chest wall deformities and large asymmetries, which can lead to low self-esteem<sup>28</sup>. This change in the perceived body image is frequently related to depressive symptoms and dissatisfaction with social and sexual life in these patients, preventing them from maintaining a good quality of life<sup>29,30</sup>. Breast reconstruction has the purpose of restoring their body image, minimizing defects caused by surgery, and consequently improving quality of life and satisfaction with breast contour<sup>12,31</sup>.

Regarding the limitations of this research, we emphasize that its final sample is not representative of the women treated in the reference center of the Federal District, due to low participant adherence and the reduced number of procedures with immediate breast reconstruction. The sample size portrays the cases of total or partial breast reconstruction in the service, which suggests that few surgeons are qualified to perform the necessary techniques, cost of these procedures to the public system is high, and access to patients in the postoperative follow-up is difficult. The center rarely performs late breast reconstruction, considering that surgeries are primarily conducted to treat the disease.

Another weakness of the study was not having a comparison group to evaluate risk measures. This fact is related to selection

bias of research participants. Lastly, we can mention another limitation: the memory bias of the women interviewed. Most of the information collected was self-reported, which might affect the findings of this research.

The strengths of this study include a validated instrument used to evaluate satisfaction and quality of life of the women surgically treated, in an attempt to qualify the produced evidence and improve the internal validity of this investigation. We used robust analytical techniques, such as linear regression, to evaluate the effect of age on quality of life indicators.

## CONCLUSION

This study evaluated satisfaction and quality of life in patients submitted to partial or total breast reconstruction after breast cancer treatment in a mastology center and identified the profile of these patients and the number of reconstructions performed over a period of time. These data are just an initial step to show the service how breast reconstruction can improve quality of life and restore the body image of breast cancer patients.

The number of women submitted to oncoplastic surgery and breast reconstruction who agreed to participate in this study, even though not corresponding to the total number of reconstructions performed in the service, is superior to that described in the literature. This study suggests that breast reconstruction improves satisfaction with breast appearance and quality of life in patients treated for breast cancer. Further longitudinal studies with a larger number of patients and different comparison groups are necessary to improve the scientific evidence on the subject.

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