



# Assessment of the quality of life in patients with breast hypertrophy before and after reduction mammoplasty

*Avaliação da qualidade de vida em portadores de hipertrofia mamária pré e pós-mamoplastia redutora*

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## ■ ABSTRACT

**Introduction:** To evaluate the results of breast reduction using the BREAST-Q<sup>®</sup> instrument. **Methods:** This is a prospective cohort study of 83 patients with breast hypertrophy who were treated at the Plastic Surgery Service of the University Hospital of the Federal University of Juiz de Fora. The subjects were older than 18, were literate, and underwent surgery between July 2013 and August 2015. We administered the BREAST-Q<sup>®</sup> reduction mammoplasty/mastopexy questionnaire, both during the preoperative period and at 6 months after surgery. The Student's t-test was used to evaluate the significance of changes in breast satisfaction and the psychosocial, physical, and sexual well-being of the patients. **Results:** Seventy-nine patients (95.1%) completed the pre- and postoperative questionnaires. Significant postoperative improvements were observed in breast satisfaction and the psychosocial, physical, and sexual well-being. Age, amount of breast tissue removed, and nutritional status did not influence the results. Surgical complications were observed in 10 patients (12.04%). **Conclusion:** The BREAST-Q<sup>®</sup> showed that patients who underwent breast reduction surgery achieved a significant improvement in quality of life and were satisfied with the surgical outcome, hospital care, and nipple appearance in the late postoperative period.

**Keywords:** Quality of life; Mammoplasty; Surveys and questionnaires; Breast; Surgical procedures, operative.

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## ■ RESUMO

**Introdução:** Avaliar os resultados da mamoplastia redutora por meio do instrumento BREAST-Q®. **Métodos:** Foram selecionadas 83 pacientes portadoras de hipertrofia mamária atendidas no Serviço de Cirurgia Plástica do Hospital Universitário da Universidade Federal de Juiz de Fora (HU-UFJF), conduzidas em um estudo de coorte prospectivo. Com idade superior a 18 anos, alfabetizadas, operadas no período entre julho de 2013 a agosto de 2015. Utilizou-se o questionário BREAST-Q®, módulo para mamoplastia redutora/mastopexia no pré-operatório e com seis meses de pós-operatório. Teste t pareado foi utilizado para avaliar a significância das mudanças na satisfação com as mamas, bem-estar psicossocial, bem-estar físico e bem-estar sexual. **Resultados:** Setenta e nove pacientes (95,1%) responderam os questionários de pré e pós-operatório. Melhoras com significância estatística foram observadas nas médias das categorias presentes quando comparados pré e pós-operatório, como satisfação com as mamas, bem-estar psicossocial, bem-estar físico e bem-estar sexual. Idade, peso retirado e estado nutricional não influenciaram os resultados. As complicações foram observadas em dez (12,04%) pacientes. **Conclusão:** O BREAST-Q® mostrou que as pacientes com hipertrofia mamária submetidas à cirurgia para redução do volume mamário tiveram uma melhora significativa na qualidade de vida em seus diversos aspectos, além de avaliar como positivo o resultado cirúrgico, a atuação da equipe médico-hospitalar e a satisfação com os mamilos no pós-operatório tardio. **Descritores:** Qualidade de vida; Mamoplastia; Inquéritos e questionários; Mama; Procedimentos cirúrgicos operatórios.

## INTRODUCTION

The breasts have great importance as both a physical and mental attribute for women. Besides creating a body image that symbolizes sensuality and sexuality and determining factors of women's femininity, they are considered one of the symbols of life and motherhood<sup>1</sup>.

Breast hypertrophy (BH) is one among the benign changes that affect the breasts and is characterized by a bulky and disproportionate size of the breast to the biotype of the woman. This disharmony between the idealized form and that which is caused by hypertrophy causes physical and psychological changes, hindering social interaction and successful interaction of women with the environment<sup>2</sup>. Patients with BH are more likely to have decreased self-esteem and sexual activity, depression, and anxiety<sup>3,4</sup>.

Assessing improvement in the quality of life of patients undergoing reduction mammoplasty has been necessary since the development of the technique, in order to validate its use in patients with BH. The improvement of symptoms such as cervical, thoracic,

and shoulder pain, and headache indicates that quality of life improves in patients undergoing this procedure<sup>5</sup>.

Several subjective and objective forms of evaluation were developed to measure changes in the quality of life in patients undergoing reduction mammoplasty, by assigning scores to increase the reliability of the results<sup>6</sup>. The application of these tools enabled assessment of several variables related to the satisfaction of the patients undergoing this surgery.

Although a high degree of satisfaction and improvement in quality of life has been previously reported in the literature, few studies have used research instruments that are specific for reduction mammoplasty or have reassessed the same sample in the preoperative and late postoperative periods.

## OBJECTIVE

To obtain reliable results, we decided to assess the results of reduction mammoplasty and the physical, social, and psychological impact in patients undergoing surgery by administering the BREAST-Q®<sup>7,8</sup> questionnaire.

BREAST-Q® is a tool for evaluating the body image and quality of life in patients undergoing breast surgery, consisting of four modules specific for breast augmentation, breast reduction, breast reconstruction, and mastectomy without reconstruction in addition to a common module comprising relevant items for all patients undergoing breast surgery. BREAST-Q® can be used to investigate the impact and efficacy of breast surgery from the patient's perspective pre- and postoperatively<sup>7</sup>.

## METHODS

For this prospective cohort study, 83 patients with BH were consecutively selected and treated at the Plastic Surgery Service of the University Hospital of the Federal University of Juiz de Fora (HU-UFJF) (Juiz de Fora, Minas Gerais, Brazil, belonging to the Unified Health System of Brazil). The selected patients had not undergone any other surgical procedure on the breasts or bariatric surgery, were aged over 18 years, were literate, and underwent surgery from July 2013 to August 2015.

All participants signed an informed consent form approved by the Research Ethics Committee of the HU-UFJF (number 309.134, dated June 24, 2013).

The patients were identified, and the module for reduction mammoplasty/mastopexy of the BREAST-Q® questionnaire, an instrument validated in Brazil, was used for data collection<sup>8,9</sup> in the preoperative period and 6 months after surgery. The questionnaire was administered to 83 patients in the preoperative period and to 79 patients 6 months after surgery at the HU-UFJF Plastic Surgery Outpatient Clinic and at predetermined times, according to the surgical schedule. The questionnaires were self-administered with the supervision of one of the researchers, all previously trained to clarify doubts and help patients with difficulties in understanding it. Simultaneously with the administration of the BREAST-Q®, data regarding age, color, body mass index (BMI), and subsequently, the amount of breast resected were collected.

The surgical technique used was the inverted T associated with the techniques of Silveira Neto, Skoog, or Torek for elevation of the areola pedicle, which varies according to each breast.

For statistical evaluation, we used the Q-Score software<sup>6,7,9</sup>, a specific program for analyzing the BREAST-Q® questionnaire. This software provides clinicians and researchers with a simple and accurate analysis of their data as the scores are calculated from the answers and graded on a scale of 0-100: the higher the score, the better the quality of life related to health and the greater the satisfaction. The paired t-test was used to assess the significance of changes in breast

satisfaction and psychosocial, physical, and sexual well-being.

A  $p$ -value  $< 0.05$  was considered significant. Statistical analyses were performed using SPSS version 21.0 software.

## RESULTS

Eighty-three patients underwent reduction mammoplasty between July 2013 and August 2015. Seventy-nine patients (95.1%) completed the pre- and postoperative questionnaires. Demographic data are presented in Table 1. The mean age was  $38.97 \pm 12.97$ . The mean weight of resected tissue in the right and left breast was  $812.91 \pm 477.79$  g and  $831.11 \pm 497.44$  g, respectively. The highest total weight of breast resected was  $5445 \pm 12.97$  g. The mean BMI of patients in the preoperative period was  $29.9 \pm 3.74$  kg/m<sup>2</sup>.

Postoperatively, statistically significant improvements were observed in breast satisfaction, and psychosocial, physical, and sexual well-being (Table 2).

Preoperative and postoperative scores were  $16.5 \pm 10.59$  and  $78.37 \pm 16.36$  for breast satisfaction,  $27.05 \pm 16.42$  and  $84.54 \pm 17.82$  for psychosocial well-being,  $27.40 \pm 16.69$  and  $78.86 \pm 23.72$  for sexual well-being, and  $52.14 \pm 16.01$  and  $77.26 \pm 13.52$  for physical well-being, respectively (all  $p < 0.001$ ) (Table 2).

The sample was divided into two groups to assess the impact of nutritional status on the results: patients with a BMI below the median ( $29.7$  kg/m<sup>2</sup>) and patients with a BMI above the median. Although statistical significance was not observed, patients with a BMI below the median had a higher degree of satisfaction in psychosocial ( $88.45$  vs.  $81.47$ ,  $p = 0.11$ ) and sexual ( $81.78$  vs.  $78.47$ ,  $p = 0.57$ ) well-being. On the other hand, patients with a BMI above the median showed superior improvement in physical well-being ( $77.88$  vs.  $77.06$ ,  $p = 0.808$ ). There were no differences between groups in the evaluation of the surgeon, surgical team, and hospital care, and all items received scores close to 100.

Patients above the median age were slightly more satisfied with the result than those below the median. Physical well-being was higher in the postoperative period of older patients vs. younger patients ( $78.26$  vs.  $76.93$ ,  $p = 0.667$ ) while breast satisfaction ( $80.46$  vs.  $76.33$ ,  $p = 0.26$ ), psychosocial well-being ( $85.34$  vs.  $83.78$ ,  $p = 0.701$ ), and sexual well-being ( $83.53$  vs.  $76$ ,  $p = 0.176$ ) were higher in younger patients, despite the lack of statistical significance.

Patients with a total reduction in breast weight below the median ( $1502.5$  g) had a more marked improvement in psychosocial well-being ( $20.0$  vs.  $25.17$ ,  $p = 0.29$ ) and were slightly more satisfied with the result than those whose reduction in breast weight was above

**Table 1.** Demographic data and descriptive statistics.

	n	Minimum	Maximum	Mean	Standard deviation
Age, years	83	18.00	64.00	38.9700	12.97838
BMI, kg/m <sup>2</sup>	74	22.40	39.69	29.9000	3.74741
Right breast	81	85.00	2885.00	812.9100	477.79552
Left breast	81	60.00	2560.00	831.1100	497.44540
Total	81	145.00	5445.00	1644.0200	956.22670

N = Sample number; BMI = body mass index.

**Table 2.** Results and changes in the pre- and postoperative scores.

	Preoperative			Postoperative			p
	n	Mean	Standard deviation	n	Mean	Standard deviation	
Satisfaction with breasts	79	16.557	10.5996	79	78.37	16.369	0.001
Psychosocial well-being	78	27.051	16.4292	78	84.54	17.829	0.001
Sexual well-being	65	27.40	16.692	65	78.86	23.720	0.001
Physical well-being	76	52.14	16.011	76	77.26	13.528	0.001

N = Sample number; p = Value of statistical significance.

the median (91.54 vs. 90.36,  $p = 0.72$ ). In these patients, the scores for breast satisfaction (75.67 vs. 81.28,  $p = 0.133$ ), physical well-being (75.36 vs. 79.61,  $p = 0.174$ ), and sexual well-being (78.92 vs. 81.68,  $p = 0.622$ ) were higher postoperatively.

Complications were observed in 10 patients (12.04%) who had some type of intercurrent, one with a hematoma that was drained in an outpatient setting, one with a keloid scar that was treated with resection and infiltration with intralesional corticosteroids, three with some degree of fat necrosis, one with a hypertensive pneumothorax treated with thoracic drainage, and four with areola necrosis (one with bilateral and three with unilateral necrosis), two of whom were treated surgically.

## DISCUSSION

The breast represents femininity, symbolizing motherhood and the female sexuality. Breastfeeding, a function of the mammary gland, creates a close relationship between the organ and the reproduction of the species<sup>3,4</sup>.

BH is a benign alteration that affects the breasts, causing an increase in volume that is disproportionate to the biotype of the woman. Thus, this deformity causes physical and psychological consequences, such as depression and anxiety, leading to social isolation and suffering with the loss of self-esteem and libido.

Surgery aims to reduce breast volume, improve aesthetics, and helps correct postural problems, back pain, and ptosis, especially after pregnancy and lactation<sup>2,10</sup>. Mammoplasty has also been used to obtain aesthetic or postural balance in patients undergoing mastectomy or sectionectomy/quadrantectomy for contralateral breast cancer.

Surgical therapy results in an increase in the quality of life, which has been used since the end of the previous decade as an indicator in the assessment of healthcare services provided to the population. Moreover, the quality of life has been incorporated into care services and has been influencing therapeutic decisions and behaviors of health teams<sup>11</sup>.

Several evaluations were made with more specific samples of patients in order to assess the relationship between quality of life and reduction mammoplasty in the groups studied. Patients under 18 years of age undergoing surgery were retrospectively analyzed, and a significant prevalence of limiting symptoms was found in these patients preoperatively, encouraging early surgery to attenuate them<sup>12</sup>.

Although the analyses of the above-mentioned instruments follow rigid methodologies that have already been exhaustively validated and used, any attempt to address quality of life is challenging. The use of several instruments in the same study may be due to the difficulty in finding an ideal instrument for this type of analysis. Hermans et al.<sup>13</sup>, Mello et al.<sup>14</sup>, and O' Blenes et al.<sup>15</sup> used the Rosenberg self-esteem scale and the SF-36 (Short Form Health Survey) and found a positive effect on the quality of life of patients undergoing reduction mammoplasty.

Hermans et al.<sup>13</sup> assessed pain using the EQ-5D (European Quality of Life-5 Dimensions) questionnaire. Saariniemi et al.<sup>16</sup>, in turn, used specific instruments to determine whether breast augmentation significantly reduced pain as well as reduced limitations on daily activities, which is in agreement with the results of Sabino Neto et al.<sup>17</sup>

Additional evidence of pain reduction after breast reduction was the decrease in the use of analgesics and

nonsteroidal anti-inflammatory drugs by 92 patients undergoing this procedure<sup>16</sup>.

It should also be emphasized that the samples assessed with the instruments had different characteristics, making the general conclusions obtained in these analyses less reliable<sup>6</sup>.

The BREAST-Q<sup>®18</sup> is a new instrument for assessing body image and quality of life in patients undergoing breast surgery. It was developed at the Memorial Sloan Kettering Cancer Center and the University of British Columbia, following strict rules of international guidelines, such as those of the U.S. Food and Drug Administration and Scientific Advisory Committee of the Medical Outcomes Trust<sup>6,7,19-21</sup>. It was translated into Portuguese after authorization and compliance with the norms of the institution that holds the questionnaire's copyright<sup>9</sup>.

The BREAST-Q<sup>®</sup>, the analysis tool used in this study, has already been used in a study that compared preoperative and 6-week postoperative results and found that breast reduction increases satisfaction with the appearance of the breasts as well as physical, sexual, and psychosocial well-being and that the satisfaction of patients is strongly related to satisfaction with their appearance<sup>5</sup>. Coriddi et al.<sup>5</sup> indicate as a limitation of their study the cross-sectional design and state that further studies evaluating patients 6 weeks after breast reduction should be conducted to evaluate the results in the long term.

The patients' answers to the questionnaires were included in the Q-score, which consolidates the answers into a single numerical value for each category, ranging from 0 to 100<sup>7,8</sup>.

It is important to emphasize that, in the study conducted by our institution, the second questionnaire was assessed 6 months postoperatively, a period in which the surgical outcome tends to be more similar to the permanent result and therefore ruling out the bias of gratitude, as the closer the postoperative period is to the surgery the stronger are the memories of breast deformity in these individuals.

Although one of the biggest complaints of mammoplasty is the size of the scars, the degree of satisfaction (mean score of  $79.4 \pm 16.2$ ) indicates that patients are satisfied with the scars of the breasts, as in the BREAST-Q<sup>®</sup>, questions about satisfaction with the size and quality of the scar are included.

Romeo et al.<sup>22</sup> evaluated 51 patients using five questionnaires (the SF-36, Hamilton Anxiety Rating Scale, Hamilton Depression Scale, Female Sexual Function Index, and a cicatricial evaluation) and found that the surgery led to a better perception of body self-esteem and interpersonal relationships and that the scar did not influence the perception of sexuality

of women, given that their postoperative satisfaction was greater as time went on.

Age, nutritional status, and weight of the resected tissue did not influence the perception of quality of life assessed using the BREAST-Q<sup>®</sup>, although the results suggest further investigations.

The use of several questionnaires leads to results similar to those achieved using the BREAST-Q<sup>®</sup>, which allows us to affirm the range of information obtained with a single method, making this a reliable tool for evaluating the results of breast surgery. We highlight in this study the administration of pre- and postoperative questionnaires in the same sample; i.e., the patients who answered the BREAST-Q<sup>®</sup> preoperative module were the same patients who underwent surgery and subsequently answered the BREAST-Q<sup>®</sup> postoperative module for reduction mammoplasty/mastopexy 6 months after surgery.

## CONCLUSION

BH continues to be a body alteration that impairs women's quality of life, worsening their self-image, work activities, and body aesthetics. This study demonstrated, using the BREAST-Q<sup>®</sup> questionnaire, that breast reduction mammoplasty significantly improved breast satisfaction and physical, psychosocial, and sexual well-being. This study also assessed the satisfaction of patients with the results of the surgery, the information provided to them, the nipples, the plastic surgeon, the team, and the hospital reception, showing high scores in their evaluations.

This study showed that patients with BH undergoing surgery to reduce breast volume had a significant improvement in the various aspects of quality of life and evaluated as positive the surgical results, the medical hospital team, and their nipples.

The development and validation of the BREAST-Q<sup>®</sup> represents an important advance for plastic and reconstructive breast surgery because it is a specific method to assess these surgeries in addition to serving as a reference for comparing different studies and populations undergoing surgery.

## COLLABORATIONS

- |             |   |
|-------------|---|
| <b>MPDC</b> | Conception and design study, data curation, final manuscript approval, project administration, realization of operations and/or trials, supervision, visualization, writing - original draft preparation. |
| <b>AMDC</b> | Conceptualization, final manuscript approval, visualization, writing - review & editing.  |

<b>LDC</b>	Conceptualization, final manuscript approval, visualization, writing - original draft preparation, writing - review & editing.
<b>MTD</b>	Conceptualization, data curation, final manuscript approval, realization of operations and/or trials, supervision, visualization, writing - review & editing.
<b>EPVJ</b>	Conceptualization, final manuscript approval, visualization, writing - review & editing.
<b>AC</b>	Analysis and/or data interpretation, final manuscript approval, formal analysis, methodology, realization of operations and/or trials, software, validation, visualization.

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