Patients undergo breast reduction in the hope of achieving an improvement in their quality of life, less social and sexual embarrassment, and greater ease in performing physical activities and finding appropriate clothes. Women with large breasts may suffer from low self-esteem and seek out surgery as a way of relieving emotional and physical discomfort. Plastic surgeons are understandably concerned with achieving a postoperative period free of complications and an acceptable final aesthetic result.

Although breast reduction surgery is a relatively common procedure, its benefits to patients have seldom been quantified in an objective and standardized way. Before surgery, the health-related quality of life of these patients can be impaired in various ways, as compared to women without mammary hypertrophy. Their main complaints are related to pain in the low back region and impact on functional capacity; that is, impact on their daily routine and the complex interaction of clinical variables and psychosocial factors.

Traditionally, the evaluation of a medical, clinical, or surgical procedure is based on objective data, such as morbidity and mortality. In this study, quality-of-life instruments were used to demonstrate the impact of a surgical treatment in an objective way, revealing patient

**Background:** Both physical health and psychosocial outcomes are important issues in the evaluation of medical treatment. Women with breast hypertrophy may suffer from low self-esteem and reduced functional capacity because of the size of their breasts.

**Objective:** The aim of this study was to evaluate the impact of reduction mammaplasty on self-esteem and functional capacity in patients with breast hypertrophy.

**Methods:** One hundred patients with breast hypertrophy who ranged in age from 18 to 55 years and who had undergone no previous mammary surgery were selected from the Plastic Surgery Outpatient Clinic of the Federal University of São Paulo (UNIFESP-EPM). They were randomly allocated into two groups (A and B) of 50 patients each. Patients from group A were submitted for reduction mammaplasty while those from group B were placed on the waiting list and used as a control group. At the beginning of the study, all patients were interviewed to collect clinical and demographic data and to have their self-esteem and functional capacity measured. Two Brazilian-validated versions of quality of life measurement instruments were chosen: the Rosenberg Self-Esteem Scale and Rolland–Morris (to assess functional capacity). A visual analog scale (VAS) was used to evaluate pain intensity. Six months after the beginning of the study, these instruments were again administered to both groups.

**Results:** Forty-six out of 50 patients from each group (A and B) completed the study. The mean age of group A was 31.6 years (SD, 11 yrs), and that of group B was 32.3 years (SD, 10 yrs). The mean weight of removed breast tissue from group A patients was 1052 g (SD, 188 g). A decrease on the score of Rosenberg Self-Esteem Scale of patients from group A indicated an improvement of self-esteem ($P < .001$). Functional capacity had improved 6 months after reduction mammaplasty (group A) as compared to the control group. Intensity of pain evaluated by the VAS in the lower back region decreased from 5.7 to 1.3.

opinions without the interference of clinical staff. These instruments offer a reliable and valid method to evaluate the impact of the surgery on patient health.6

METHODS
This study was conducted at the Division of Plastic Surgery at São Paulo Federal University (UNIFESP-EPM) between April 2002 and March 2004. One hundred patients with breast hypertrophy, aged from 18 to 55 years, with no previous mammary surgery, were selected from Plastic Surgery Outpatient Clinic of UNIFESP-EPM. All patients signed an informed consent form and were included in a prospective study. Patients over the age of 55 years and those with a body mass index greater than 30 kg/m², asymmetric mammary hypertrophy, chronic diseases, and smokers and those who used medication daily were excluded. The selected patients were randomly allocated into two groups (A and B) of 50 patients each. Those in group A underwent reduction mammoplasty, while those in group B were placed on the waiting list and formed the control group. All patients were first interviewed to collect clinical and demographic data and then completed questionnaires relating to self-esteem, functional capacity, and low back pain. Six months after surgery (group A) and after the initial interview (group B, control group) these three variables were reanalyzed using the same questionnaires.

The instruments chosen to evaluate the alterations in quality of life resulting from reduction mammoplasty were the Rosenberg Self-Esteem Scale (Brazilian-validated version), a specific and self-administered questionnaire that evaluates self-esteem;7 and the Roland–Morris questionnaire (Brazilian-validated version) to evaluate functional capacity alterations.8 A visual analog scale, a simple and fast method to evaluate pain intensity that has already been used to detect alterations in pain during the postoperative period in other types of surgery, was also administered to patients in each group.9 The score range for the Rosenberg Self-Esteem Scale was from 0 (least self-esteem) to 30 (most self-esteem). The range for the Roland–Morris questionnaire was from 0 (best performance) to 24 (worst performance).

Reduction mammoplasty was performed under general anesthesia at São Paulo General Hospital; all procedures were performed by the same surgical team. The chosen technique included initial markings with rigid outlining that were transferred to the contralateral breast, and positioning of the nipple–areolar complex (NAC) after breast restoration. Upper or upper medial dermis-fat pedicles were used to preserve NAC vascularity and sensitivity. An inverted-T approach was used in all cases.

Statistical Analysis
Demographic variable data were analyzed by average (M) and standard deviation (SD) and categorical data by proportion (%). To compare groups A and B, the Student t test was used for numeric variables and the χ² test was used for categorical ones. When necessary, the Fisher exact test was used.

The variance analysis with repeated measures (ANOVA) was performed to determine statistical differences in groups A and B, in the 2 evaluation periods and for each of the researched aspects (self-esteem, functional capacity, and low back pain). An inferior value of 0.05 (P < .05) was considered as the level required for statistical significance.

RESULTS
Forty-six out of 50 patients in each group completed the study. The mean age was 31.6 years (SD, 11 yrs) for group A and 32.3 years (SD, 10 yrs) for group B. The mean body mass index was 25.43 kg/m² (SD, 21.4–29.9) for group A and 25.69 kg/m² (SD, 20.0–29.9) for group B. The mean weight of breast tissue removed was 1052 g (SD, 188 g).

A decrease in Rosenberg Self-Esteem Scale score average for group A (preoperatively compared to 6 months postoperatively) reflected an improvement in self-esteem (P < .001). Patients from group B showed no change in self-esteem score average (P > .999; Table 1). Functional capacity had improved 6 months after reduction mammoplasty (group A) when compared to controls (group B). Before surgery, the statement “I frequently change positions trying to reach a more comfortable position for my back” was mentioned by 80% of the patients in both groups. Six months after surgery, it decreased to 19.6% among patients from group A while remaining the same for group B (Table 2). Pain intensity in the low back region dropped from 5.7 to 1.3 (Table 3).

Eleven patients in group A and 12 patients in group B had larger breasts and were considered unable to perform daily activities, demonstrating that a high degree of mammary hypertrophy can cause alteration of habits and functional incapacity. After surgery, this number fell to zero in group A, indicating an improvement in patients’ functional capacity after reduction mammoplasty. There was no change among the patients in group B.

DISCUSSION
Patient concerns about health should be considered when evaluating the effectiveness of a medical treatment. In the field of aesthetic plastic surgery, there are several important components to the evaluation of postoperative results, such as aesthetic parameters, relief of complaints, and improvement in physical, social, and emotional aspects of life.2,5,10 Pain is a significant symptom in patients with mammary hypertrophy, and both pain and overall health status are markedly improved by breast reduction.5 Evaluation of changes in low back pain and daily activities are also important issues for those who choose to undergo breast reduction surgery.

One of the most important advances in modern medicine is the understanding that the evaluation of results of proposed treatments should be analyzed not only by the medical team but also by patients. Differences in quality of life statement assessments differ among patients and doctors.
Shakespeare and Cole\(^9\) showed that functional capacity underwent positive alterations 6 months after reduction mammaplasty, and that patients reported feeling more comfortable and secure with their new breast size. Collins et al.\(^6\) studied the effectiveness of breast reduction in alleviating the symptoms of macromastia by comparing baseline and postoperative health status, using a series of well validated self-report instruments. The study had a prospective design with a surgical intervention group and two control groups: a hypertrophy control group with bra cup sizes D or larger and a normal control group with bra cup sizes less than D. The effectiveness of nonsurgical interventions in relieving the symptoms of macromastia was also evaluated, both in the operative subjects and in the control groups. They concluded that breast hypertrophy has a significant impact on women’s health status and quality of life and conservative measures such as weight loss, physical therapy, special brassieres, and medications did not provide effective permanent relief of symptoms.

Mammary hypertrophy causes alterations in patients’ center of gravity, compromising both bones and joints. Extension of the cervical, thoracic, and lumbar columns, neck and trapeze muscular tension, and scapula supercharge are problems that can cause pain in different regions and with variable intensities. Chao et al.\(^9\) performed a study of 50 patients with breast hypertrophy, in which the medium index of pain was six. When they evaluated muscular tension in some of the muscles that provide spinal support, they noticed that muscular changes after surgery resulted in improved posture and reduced pain intensity.

Mizgala and MacKenzie\(^11\) confirmed a decline in complaints of severe pain from 41% to zero after reduction mammaplasty; however, 16% of surgery patients complained of the continuation of some degree of pain (light or moderate). Posture malpositions that developed in the course of a lifetime with mammary hypertrophy were not corrected when the excess tissue was removed. Postoperative exercise programs to improve posture should be emphasized after surgery in order to lessen symptoms.

Seventeen patients in our study complained of low back pain after reduction mammaplasty, with the index of pain varying between 1 and 10. Three of the 40-year old patients reported no improvement of low back pain.

**CONCLUSION**

Reduction mammaplasty can improve self-esteem and functional capacity, and provide relief of postural back pain. However, complete relief of low back pain symptoms could not be reached in all patients through surgery alone.

**DISCLOSURES**

The authors have no disclosures with respect to the content of this paper.

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