

Increased Capacity for Work and Productivity After Breast Reduction

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Abstract

Background: Breast hypertrophy is a prevalent condition among women worldwide, which can affect different aspects of their quality of life. The physical and emotional impact of breast hypertrophy may harm daily activities, including work.

Objectives: To assess the impact of reduction mammoplasty on the ability to work and productivity of women with breast hypertrophy.

Methods: A total of 60 patients with breast hypertrophy, already scheduled for breast reduction, aged 18 to 60 years and who had formal or autonomous employment were prospectively enrolled. The Brazilian versions of two validated tools, Work Productivity and Activity Impairment - General Health (WPAI-GH) and Work Limitations Questionnaire (WLQ) were self-administered at the preoperative evaluation and six months following surgery.

Results: The median age was 33 years, median body mass index was 24 kg/m², and the median total weight of resected breast tissue was 617.5 g. According to the Brazilian classification of occupation, most patients (53%) had technical, scientific, artistic and similar occupations. There was a significant improvement in work capacity and productivity six months after the reduction mammoplasty, denoted by a decrease in presenteeism, absenteeism, and WLQ Productivity Loss Score (Wilcoxon analysis of variance: $P < .0001$ for each of these domains).

Conclusions: Reduction mammoplasty increases the work capacity and productivity of Brazilian women with breast hypertrophy.

Level of Evidence: 4

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Breast hypertrophy is a condition in which there is an increase in the size of the breasts, disproportionate to the female body. Women with this condition may suffer physical and emotional trauma¹⁻⁴ and in such cases, the plastic surgeon, through reduction mammoplasty, may provide patients with a more personally acceptable body shape, resulting in better social adjustment and quality of life.^{1,3,5-10}

The precise prevalence of breast hypertrophy has not been evaluated; however, breast reduction is one of the most frequently performed procedures by plastic surgeons worldwide.^{11,12} According to the American Society for Aesthetic Plastic Surgery (ASAPS), in 2015, 103,077 breast reduction operations were performed in the United States.¹¹ An annual survey by the International Aesthetic Surgery Society (ISAPS) on the number of plastic surgeries

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performed, showed that in 2014 there were 432,280 breast reduction surgeries worldwide, and of these, 77,169 were performed in Brazil. In a ranking of surgeries, breast reduction was the ninth most-performed surgery worldwide and accounted for 4.5% of aesthetic plastic surgeries performed that year.¹²

The capacity to work refers to the capacity that employees have to carry out their professional tasks in accordance with job requirements, taking into account their health and their physical and mental abilities.¹³ Health is considered as the factor with the greatest impact on an individual's capacity to work.¹⁴ Several evaluation methods that offer different perspectives and approaches to quantify the impact of health problems on labor are available.¹⁵ Using objective and technical parameters to evaluate productivity is challenging and not uniformly applicable to all occupations. This has made subjective or self-informed methods a promising way of gathering information about the perceptions of workers as to how their health affects their ability to work.¹⁵

Women with increased breast size experience symptoms such as pain in the neck, shoulders and lumbar spine, headache, intertrigo in the inframammary fold, difficulty in performing daily activities, paresthesia in the hands (due to weight on the anterior chest wall and compression of the brachial plexus), difficulty in exercising, low self-esteem, and body dissatisfaction.^{3,9,10,16,17} These symptoms could have a negative impact on worker health and productivity.^{18,19}

In Brazil, women comprise the majority of the population, live longer, and are having fewer children; in addition, their proportion in the labor market is increasing.¹⁵ Given the high prevalence of breast hypertrophy in the country, and that non-performance at work and loss of productivity due to this condition have significant social, occupational, and economic implications, it was imperative to assess the work capacity and the productivity of women with breast hypertrophy undergoing breast reduction. No study in the literature that addressed this problem was found, thus, making this study unique.

METHODS

The Ethics Committee of the Universidade do Vale do Sapucaí has reviewed and approved the study protocol, and written informed consent was obtained from all the participants before enrollment.

The study included all women with breast hypertrophy, according the criteria of Sacchini et al and Franco and Rebello,^{21,22} who were scheduled for breast reduction at the university hospital of the Universidade do Vale do Sapucaí from June 2014 to May 2015 and who met the eligibility criteria. Women between 18 and 60 years with

a body mass index (BMI) between 19 and 30 kg/m² and working outside the home, with formal employment or self-employed were included. Women undergoing prior reparative or aesthetic procedures for their breasts and with contraindications to surgery, those who were unable to read the instruments used and those who refused to participate were not included.

Patients underwent breast reduction using conventional techniques^{23,24} under general anesthesia, by the same surgical team. Patients received intravenous antibiotics during their hospital stay (cephalothin, 1g at induction of anesthesia and every six hours) and were discharged with a prescription of cephalexin, 500 mg every six hours for seven days. If no relevant complications were recorded, patients were released to return to work one month after the operation, with an instruction of using a supportive bra and avoiding intense physical activities for two additional months.

To standardize the occupations of the participants in the present study, we used the "Brazilian Classification of Occupations", which is an official classification of Brazilian's government that recognizes and classifies the occupations in Brazil.²⁵

To assess the capacity to work and productivity, the Brazilian versions of two validated tools were used: the Work Productivity and Activity Impairment - General Health (WPAI-GH), which measures the effects of general health and specific symptoms in the ability to work,^{26,27} and the Work Limitations Questionnaire (WLQ), designed to measure the degree of interference of health problems in the performance of work tasks and to estimate the loss of productivity associated with this interference.^{15,19} Both questionnaires were self-administered, before and six months after surgery. Blank copies of WPAI-GH and WLQ do not accompany this paper due to the copyright holder's disclosure agreement.

The WPAI-GH generates four scores assessing the effect of ill health on various aspects of work. These scores, expressed as percentages, are as follows: absenteeism (percentage work time missed due to health); presenteeism (percentage impairment at work due to health); sum of absenteeism and presenteeism (percentage overall work productivity loss due to health); and the percentage daily activity impairment outside of work due to health.^{26,27}

There are four scales in the WLQ questionnaire: time management, which addresses the difficulty in dealing with time and planning tasks; physical demand, which examines the ability to perform tasks at work involving body strength, movement, endurance, coordination, and flexibility; mental-interpersonal demand, which assesses the cognitive ability to perform tasks and interact socially at work; production demand, which evaluates reduced productivity at work that has been independently assessed. Each scale generates a score ranging from 0 (no limitation)

to 100 (limited all the time). The score indicates the percentage of time at the last two weeks, in which the individual was limited to perform their tasks at work, ie, a scale of 20 on the scale of production demand indicates that the individual was limited to 20% of the dedicated time to develop this type of task. It also generates the WLQ index, which is calculated by a formula that balance the scores of four scales.^{15,19}

Statistical Analysis

Descriptive statistics were presented as medians, means, and standard deviations for numerical variables and absolute and relative frequencies for categorical variables. The Wilcoxon signed-rank test was used to compare the data obtained before and after surgery.²⁸

For the analysis, we used the SPSS 22.0 software (Statistical Package for Social Sciences, Inc., Chicago, IL) and BioEstat 5.0 (Institute for Sustainable Development Mamirauá, Belém, PA, Brazil), with the level of significance set at 0.05.

RESULTS

In the period delimited for the study, all the patients with breast reduction operation already scheduled were consecutively assessed for eligibility criteria. A total of 60 female patients met eligibility criteria and were invited to participate. All of them agreed and signed the consent form. No patients withdrew from the study (there were no losses or exclusions), and all the 60 patients completed the six-month follow up.

The age of the patients ranged between 18 and 60 years (median, 33 years; mean, 30 ± 11.7 years). The BMI ranged from 20 to 28 kg/m² (median, 24 kg/m²; mean, 24 ± 1.7 kg/m²). Most of the patients were Caucasian (65%). Twenty-six (43.3%) patients had a partner, while 34 (56.7%) did not. Most of the patients (91.2%) reported not having reached menopause. Most patients (53%) had high school education. A small portion (17%) had primary education and 30% had acquired college education.

Table 1 presents the occupations of the patients according to the Brazilian Classification of Occupations.²⁵ Examples of occupations included in the group “Technical, scientific, artistic or similar occupations” are as follows: health professionals such as nursing technicians, nurses and physiotherapists, besides teachers and musicians. The group “Occupations that provide services” includes professionals such as maids and hairdressers, and the group “Administrative Occupations” includes farmers and traders.

The reduction mammoplasty was performed under general anesthesia, using conventional techniques, with

Table 1. Occupations of the Patients According to the Brazilian Classification of Occupations²³

	n	%
Technical, scientific, artistic, and similar occupations	23	38.3
Occupations that provide services	17	28.3
Administrative occupations	7	11.7
Occupations of commerce and ancillary activities	5	8.3
Occupations of transformation industries and construction	4	6.7
Other occupations, undefined occupations or not declared	3	5.0
Other occupations - autonomous	1	1.7
Total	60	100

a resulting inverted-“T” scar. In 57 (95%) patients, we used a flap with a superior-medial pedicle to raise the nipple-papillary complex, and in three (5%) cases we used the superior pedicle flap. The total weight of resected breast tissue ranged from 210 to 1985 g (median, 617.5 g, mean, 465 ± 387.6 g). No drains were used.

There were no relevant perioperative complications and all the patients were discharged in the first postoperative day. Partial necrosis of the nipple-areola complex occurred in one patient (1.6%) and minor suture dehiscence in 4 (6%) patients. No major complications, such as deep vein thrombosis or embolism, surgical site infection, hematoma or seroma requiring drainage occurred. During the 6 months follow-up period, no re-interventions were necessary. All the patients were released to return to work one month after the operation.

The scores recorded for the WPAI-GH and WLQ^{15,19,26,27} questionnaires are shown in Tables 2 and 3, respectively. WPAI-GH scores indicated that the reduction mammoplasty led to a decrease in working hours lost, impairment at work, overall productivity loss and also in daily activity impairment outside of work in the sixth postoperative month, with statistical significance ($P < .0001$ for all the four scales). Assessment by WLQ also demonstrated a decrease, six months after the operation, on time, physical, mental-interpersonal and output demands ($P < .0001$ for each scale), as well as a decrease in the loss of productivity index ($P < .0001$).

DISCUSSION

It has been demonstrated how the health conditions of employees can affect their professional work. Poor health usually result in the reduction of activities and productivity at work.²⁶ Knowledge of the various aspects related to the employee’s health and job, and the causes of low productivity, allow for planning and the adoption of effective measures to encourage the worker in her work.²⁹

Table 2. Scores Recorded for the WPAl-GH in the Four Scales. Statistical Comparison Using the Wilcoxon Signed-Rank Test

	Preoperative		Postoperative		P-value
	Median	Mean ± SD	Median	Mean ± SD	
Working hours lost	0	0.09 ± 0.12	0	0.03 ± 0.004	<.0001
Impairment at work due to health	0.4	0.36 ± 0.27	0	0.25 ± 0.161	<.0001
Overall work productivity loss	0.5	0.39 ± 0.29	0	0.25 ± 0.188	<.0001
Daily activity impairment outside of work	0.5	0.34 ± 0.28	0	0.23 ± 0.161	<.0001

Table 3. Scores Recorded for the WLQ in Each of its Scale and Global Score. Statistical Comparison Using the Wilcoxon Signed-Rank Test

	Preoperative		Postoperative		P-value
	Median	Mean ± SD	Median	Mean ± SD	
Time demands	45	18 ± 29.3	0	15 ± 17.4	<.0001
Physical demands	41	25 ± 25.9	0	21 ± 36.1	<.0001
Mental-interpersonal demands	27	14 ± 25.3	0	10 ± 19.8	<.0001
Output demands	30	20 ± 27.9	0	16 ± 20.2	<.0001
WLQ productivity loss score	86	41 ± 5.6	0	11 ± 4.4	<.0001

The inclusion and appreciation of women in the labor market is essential for their financial and social independence. Although women are formally employed in Brazil, their wages are lower compared to those of men, even for the same job functions. Research studies such as the present study are important for the women's emancipation process because they help identify the hindrances to health and the appropriate treatment, enabling the development and implementation of health promotion programs and improving the working conditions, thereby promoting the professional competences of the treated individuals. The benefits that can be achieved by treating workers who present with impaired productivity because of large breasts have a positive effect on the employment of women and contribute to increased professional development and gender equality in the labor market.

Breast hypertrophy is associated with postural, circulatory, and respiratory diseases and can have negative effects on sexual function, body image, and quality of life.¹⁻⁴ Breast reduction surgery is considered safe and effective, and some of its benefits are well established in literature.^{1,3,5-10}

Chronic pain of various etiologies is an important cause of loss in the health, wellness, and productivity of the population³⁰ and it is believed that the relief of symptoms, particularly of pain, after the breast reduction surgery is one of the factors responsible for the improvement of work capacity and productivity observed in this study.

Alternative methods of treatment are routinely used in the attempt to relieve discomfort due to breast hypertrophy.

The assessment of some of these methods revealed that non-surgical measures, such as weight loss, physical therapy, special breast support, and medication were not sufficient to alleviate the symptoms related to hypertrophy of the breasts.^{31,32}

The excess breast volume in breast hypertrophy is variable. This occurrence was standardized by Franco and Rebello, who developed a classification for this condition ranging from a relative hypertrophy, determined by the disproportion between the size of the breasts and the body frame of patients, to extreme cases, the so-called gigantomastias, which correspond to grade III.¹⁷ Several authors show that the improvement of symptoms after breast reduction surgery is regardless of breast size, removed breast during surgery, height, weight, or BMI of the patient.^{5,7,10,33,34} However, many of the symptoms related with the musculoskeletal system can be explained by postural changes caused by the increased weight of hypertrophic breasts.^{8,32,35}

Breast reduction surgery has a positive impact on the self-esteem of patients,^{36,37} and the performance of employees at work improves when they are physically and emotionally capable.³⁸

Due to the wild variability of occupations among the participants of the current study, we decide to use the "Brazilian Classification of Occupations"²⁵ to classify their occupations, making possible to present the data. The occupation most frequent (53.4% of the patients) was "Technical, scientific, artistic and similar occupations,"

which includes health professionals, teachers, and musicians.

The present study demonstrated the positive impact of reduction mammoplasty on the capacity of women with breast hypertrophy to work. The results of the application of WPAI-GH showed that patients have a decrease in working hours lost, impairment at work and overall productivity loss, as well as in daily activity impairment outside of work. Moreover, an improvement in all WLQ scales was observed; in time management, physical demands, mental-interpersonal demand, and production demand, resulting in an improved productivity loss score as measured by WLQ. These findings support the claim that breast reduction surgery is not only aesthetic, but also functional.

The increased involvement of women in the active work force is a reality, and is important for society. Identifying limiting factors allow for the effective treatment of these women and results in benefits for both the employee, by reducing the possibility of wage losses due to absence from work, the risk of dismissal or other performance-related problems, and the employer, by reducing the difficulty of meeting the demands due to the absence of the worker, thus, avoiding the increased costs of replacing absent workers and preventing losses due to non-compliance demands. It can also benefit society by lowering the costs for the payment of disability insurance and disease assistances.

Absenteeism and presenteeism decrease production and are considered costs that do not add value to the final product. The increase in the cost of a product has a direct impact on the economy. Reduction mammoplasty is able to decrease worker absence and improve the productivity of workers with breast hypertrophy indicating that this surgery may result in significant cost savings for the production sector.

The results of this study also support the claim that reduction mammoplasty is a surgical procedure of an essentially functional nature. This increases the importance of this surgery for public and health management organizations, confirming that the funds distribution policy for this procedure by public and private health services could and should be reviewed.

However, this study has several limitations. First, the study design limit the external validity of the study. A randomized multicenter trial, with a much higher number of breast hypertrophy patients allocated to receive or not reduction mammoplasty, would lead to high level of evidence. The limited number of patients in this study also did not allow us to stratify them by clinical and sociodemographic aspects, such as age, BMI, breast size, education, among others, in order to determine which group had the highest value of effectiveness. Second, we were not able to determine the exact time in which patients returned to work. Despite all of the patients were released

to work after one month, it was not feasible to determine when each one had actually returned, due to differences in patients' professions, work regimen and personal characteristics. Another major limitation is that the complexity of the outcome measures in the current study prevents the identification and control of all the variables that could influence work productivity. Thus, we must recognize that there could be variables, unrelated to the patient's reduction mammoplasty, which may have improved productivity scores over the same time interval and were not assessed.

This study was not intended as an economic analysis. However, it may be regarded as the first step towards subsequent studies that quantify the economic losses generated because of breast hypertrophy and evaluate the cost-effectiveness of reduction mammoplasty with regard to improving the working capacity of women with this condition.

CONCLUSION

Reduction mammoplasty improved the work capacity and productivity of women with breast hypertrophy. Thus, its implementation, in addition to providing physical and psychological benefits for women, as previously demonstrated by several authors¹⁻⁶ can result in direct quality of life gains for patients and indirect economic gains for the production sector. This should be considered by managers of public and corporate health.

Disclosures

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