"CAROL DAVILA" UNIVERSITY OF MEDICINE AND PHARMACY
BUCHAREST DOCTORAL SCHOOL
GENERAL MEDICINE FIELD

The impact of breast reconstruction on patients' quality of life

ABSTRACT OF THE PHD THESIS

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Introduction

Postmastectomy breast reconstruction has become an integral part of the multidisciplinary approach to breast cancer treatment, a disease that affects millions of women globally each year. Breast cancer induces significant changes in a woman's life, because of the oncological resection surgery, chemotherapy, radiotherapy, and hormone treatment. While advancements in therapeutic management and early detection have significantly improved survival rates, the diagnosis of neoplasia and the subsequent effects of systemic treatments continue to substantially affect the physical and psychological well-being of patients. In this context, breast reconstruction is crucial for restoring body image and self-esteem, thereby enhancing the general well-being of patients.

The motivation behind selecting this topic is rooted in the desire to evaluate and improve the quality of life for patients diagnosed with breast cancer who undergo mastectomy and reconstructive procedures. Worldwide, plastic surgeons are continually seeking effective and personalized solutions for breast reconstruction, taking into account patient preferences, the type of breast cancer, and the necessary complementary therapies.

In recent years, the Plastic Surgery and Reconstructive Microsurgery Clinic of the "Prof. Dr. Agrippa Ionescu" Emergency Clinical Hospital has prioritized to increase the number of reconstructive procedures within a multidisciplinary approach for breast cancer The goal of the plastic surgeons has been to adopt the latest reconstructive techniques and improve patient access to high-quality treatments.

During my doctoral studies, I conducted a comparative evaluation of four breast reconstruction methods, using alloplastic materials or autologous tissue. The study aimed to identify the optimal timing for reconstruction and to assess the impact of these methods on patients' quality of life using validated instruments, such as the Short Form-36 and BREAST-Q questionnaires. This research represents the first national study focused on the quality of life of patients undergoing breast reconstruction, evaluated through comparative analysis of the two instruments. The study analyzed the differences in quality of life scores reported by patients and identified factors influencing their overall health status.

1. Breast reconstruction in breast cancer patients

Breast reconstructive procedures represent a vast and continually evolving field within plastic and reconstructive surgery, significantly contributing to the restoration of physical and psychological integrity in post-mastectomy patients. The primary goal of breast reconstruction is to recreate the natural shape of the breast by restoring volume, projection, and position while ensuring symmetry with the contralateral breast [1].

Breast reconstruction can be performed using either alloplastic materials or autologous tissue. This procedure can be conducted immediately, simultaneously with the mastectomy, or at a later stage following the initial intervention. The optimal timing for reconstruction depends on several factors, including the disease stage, planned adjuvant treatments, patient preferences, and comorbidities [2].

The medical history and clinical examination are essential for determining the appropriate type of reconstruction. The decision must be by an oncology committee, considering the necessity for chemotherapy, radiotherapy, and the possibility of performing a contralateral prophylactic mastectomy [3].

Implant-based breast reconstruction is the most common reconstructive method performed by plastic surgeons. This technique offers several advantages, such as a significantly shorter operating time (1-1.5 hours) compared to autologous flap procedures, which can exceed six hours. Additionally, it involves no morbidity at the donor site (abdomen or back), shorter hospitalization, and faster patient recovery. Moreover, reconstructive techniques using breast prostheses preserve the option of using autologous tissue for future surgeries [4].

Implant-based breast reconstruction can be performed in two stages, utilizing a tissue expander followed by the definitive implant, or simultaneously with mastectomy, known as immediate direct-to-implant reconstruction [5].

Recent innovations, such as the use of acellular dermal matrix and prepectoral reconstruction techniques, have improved both aesthetic and functional outcomes [6].

Autologous breast reconstruction remains a central element of modern approach to post-mastectomy reconstruction. The most commonly used flaps are the transverse rectus abdominis musculocutaneous (TRAM) flap, the deep inferior epigastric perforator (DIEP) flap, and the latissimus dorsi (LD) flap.

The reconstruction of the nipple-areolar complex (NAC) is considered the final stage in the breast reconstruction process, aiding in the restoration of the patient's body image. Despite being a relatively quick surgical intervention performed under local anesthesia, it significantly enhances the patients' quality of life [7].

2. Patients' quality of life after breast reconstruction

Quality of life (QoL) is a multidimensional concept that assesses an individual's well-being at a specific time [8].

Recently, health status analysis tools have been introduced to evaluate changes in patients' QoL [9]. Both generic and specific instruments for measuring health-related quality of life are well-documented in the literature. Among the most common generic instruments are the Short-Form 36 Health Survey (SF-36) and the EuroQoL-5 Dimension Questionnaire (EQ-5D), which are designed to be relevant to a diverse population and a variety of medical interventions [10].

The SF-36 assesses vitality, bodily pain, general health perceptions, mobility, mental health, and emotional and social aspects [11]. The EQ-5D evaluates mobility, usual activities, self-care, anxiety, depression, pain, and discomfort [12].

A specific instrument used by plastic surgeons is the BREAST-Q, developed to gather information on patients' QoL and satisfaction related to breast surgery. The BREAST-Q includes modules that assess QoL after mastectomy and post-reconstruction. Therefore, its use is recommended for evaluating the impact of breast surgery [13,14].

Breast cancer and its complex treatment inevitably affect multiple aspects of patients' lives, including physical, psychological, and sexual dimensions. In recent years, there has been a significant emphasis on understanding these effects to develop a multidisciplinary approach to enhance patients' quality of life [15].

Breast reconstruction has become an essential component of the treatment plan for breast cancer patients. Reconstructive interventions positively impact the psycho-socio-familial aspects of quality of life by restoring the physical appearance of the breast, improving body image satisfaction, self-esteem, sex life, and psychosocial adjustment. These factors are crucial in the healing and recovery process, ultimately determining long-term well-being [16].

3. Hypothesis and general objectives

The breast is an integral part of a woman's identity, symbolizing femininity, sexuality, beauty, and motherhood. This aspect holds significant importance within contemporary society. Mastectomy can substantially impact a woman's body image and perception of attractiveness.

Breast reconstruction has become an important element of the comprehensive therapeutic management of patients with breast cancer.

The central hypothesis of the doctoral thesis concerns the positive impact of breast reconstruction on patients' quality of life. This enhancement is evident in various domains, including physical and mental health parameters, increased self-esteem, and improved social and personal relationships.

As part of my doctoral thesis, I conducted two interrelated studies.

The first study is a descriptive analysis with the following objectives:

A. To analyze the demographic factors and therapeutic plans of patients who underwent breast reconstructive interventions at the Emergency Clinical Hospital "Prof. Dr. Agrippa Ionescu".
B. To determine the interval between mastectomy and breast reconstruction, and to identify the proper timing for performing the reconstructive procedure.
C. To evaluate the surgical plans for various types of breast reconstruction.
D. To assess and analyze postoperative complications and the length of hospital stay among breast reconstruction patients, according to the reconstructive method performed.

The second study is a prospective investigation that evaluated the quality of life of patients who underwent immediate or delayed breast reconstruction. This study involved comparing preoperative and one-year postoperative quality of life indices.

4. The general research methodology

All patients included in this study underwent breast reconstructive surgery at the Plastic Surgery Clinic of the Emergency Clinical Hospital "Prof. Dr. Agrippa Ionescu", over a five-year period, from January 1, 2018, to January 31, 2023. Four distinct reconstructive methods were performed and evaluated:

- immediate breast reconstruction with an expander, followed by replacement with a definitive implant (in two surgical stages);
- reconstruction with a fasciocutaneous flap based on perforators from the deep inferior epigastric pedicle (DIEP), transferred using microsurgical techniques;
- delayed reconstruction with a latissimus dorsi flap and silicone implant;
- immediate direct-to-implant reconstruction.

Approval for data collection and use of hospital case files and databases was obtained from the Ethics Committee of the Clinical Emergency Hospital "Prof. Dr. Agrippa Ionescu". Informed consent was obtained from all patients, who were informed about the clinical study being conducted in the Plastic Surgery department. The study's objective, to evaluate the quality of life after breast reconstruction, was clearly communicated to the patients. They were assured that the study would not involve invasive procedures and that two types of questionnaires with quality of life assessment scales would be distributed before and one year after the reconstructive intervention. Additionally, patients were informed that their data would be recorded electronically, ensuring the confidentiality of personal information.

The criteria for inclusion in the studies of this doctoral thesis were as follows:

- Histopathological diagnosis of breast cancer - patients diagnosed with breast cancer and scheduled for oncological resection.
- Age **-** patients aged between 18 and 75 years.
- Type of breast reconstruction - patients who underwent either immediate or delayed breast reconstruction, irrespective of the reconstructive technique employed.
- Oncologist's approval -patients who received consent from the oncologist or the oncological commission for the reconstructive intervention.
- Mastectomy without breast reconstruction**:** patients with breast cancer who underwent oncological resection without subsequent breast reconstruction.
- Informed consent**:** patients who signed the informed consent form to participate in the study.

The study database was created with medical information obtained from admission papers, medical letters and postoperative records. The database included: demographic information (age at the time of surgery, education, income and marital status); smoking history; the characteristics of breast cancer (the histopathological appearance of the tumor,

hormone receptors, lymph node invasion, staging); chemotherapy treatment; radiotherapy; hormone therapy; type of breast reconstruction; symmetrization interventions; surgical techniques; postoperative complications; the number of days of hospitalization.

Data were centralized and processed in Microsoft Excel 2023, version 16.76. Statistical analysis was performed using IBM SPSS - Statistical Package for version 29.0.2.0.

5. Identification of timing between mastectomy and breast reconstruction

The first study within the doctoral research aims to establish the optimal timing for breast reconstruction based on the staging of breast cancer, lymph node invasion, and adjuvant treatments, as well as to evaluate new reconstructive plans for patients diagnosed with breast cancer.

This study is an analytical, descriptive study. 120 patients admitted to the Plastic Surgery and Reconstructive Microsurgery Clinic of the Emergency Clinical Hospital “Prof. Dr. Agrippa Ionescu” for breast reconstruction between January 2018 and January 2023 were included.

All patients underwent oncological resection of the breast. Nine bilateral mastectomies were performed, including five "nipple-sparing" mastectomies, for which immediate reconstruction with implants was performed, and 47 unilateral skin-sparing mastectomies. Modified radical mastectomy was indicated for 64 patients.

Axillary lymphadenectomy was recommended for 93 patients, representing 77.5%, while the sentinel lymph node technique was used for 15 patients. 55.8% of the total number of patients included in the study did not have lymph node invasion.

The average number of positive lymph nodes was correlated with the stage of the neoplasm using the chi-square (χ^2) significance test. The result was highly statistically significant, with $p<0.001$.

The average duration between mastectomy and breast reconstruction was **13.75** months, ranging from 0 to 108 months (Figure 5.1). The value of 0 was considered for immediate breast reconstruction, with 35.83% of the total reconstructive surgical interventions being performed simultaneously with mastectomy. Among the 43 patients who underwent immediate reconstruction, 27 were aged 49 years or younger, and 13 were

between 31 and 39 years old. Twelve patients, representing 10% of the total, received breast reconstruction one year after oncological resection.

The four breast reconstructive techniques were evaluated. Alloplastic materials were exclusively used in 65.83% of the patients, while a fasciocutaneous flap based on perforators from the deep inferior epigastric pedicle, freely transferred, was used in 13.3% of the cases.

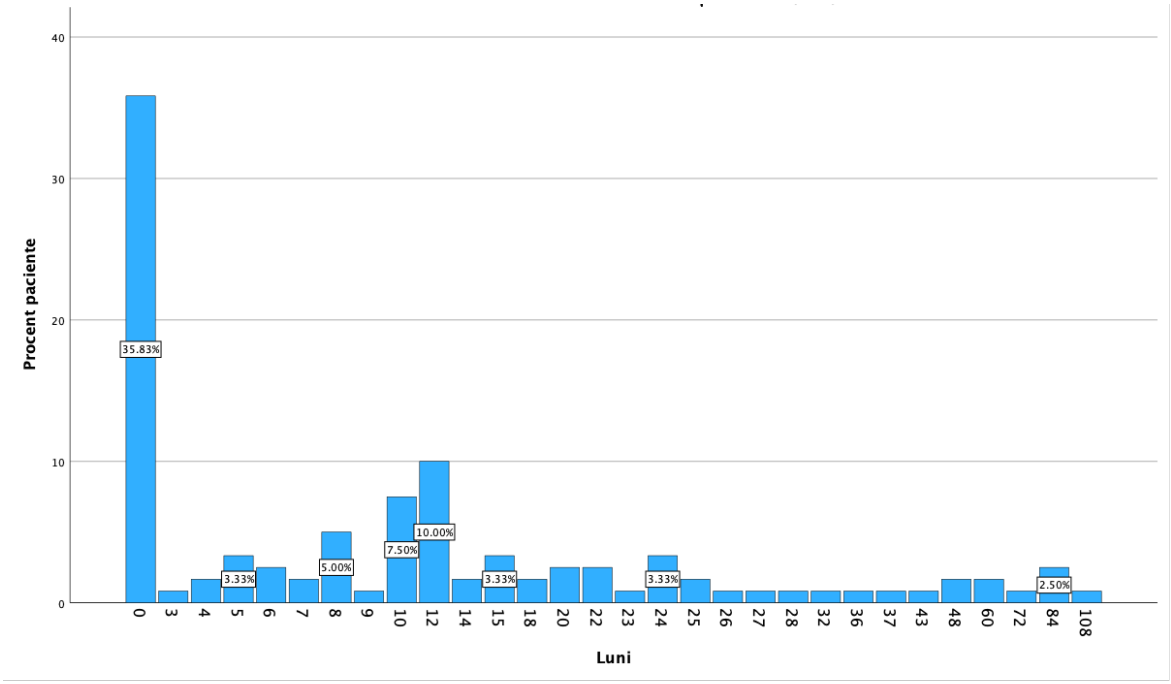

Figure 5.1. The average period (months) from mastectomy to breast reconstruction

A statistically significant association was identified between breast reconstruction with implant and the early stage of breast cancer ($p < 0.001$).

Radiotherapy was indicated in 54.2% of cases, while immunotherapy was prescribed for 7 patients.

The choice of reconstructive technique was influenced by adjuvant radiotherapy ($p<0.001$).

The evaluation of the timing between mastectomy and breast reconstruction based on the types of reconstruction revealed an average duration of **7.97 months** for implant-based reconstruction (Table 5.1).

Table 5.1. Evaluation of the period between mastectomy and breast reconstruction based on the reconstructive technique

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Implant	39	7.97	10.109	1.619	4.70	11.25	0	37
Latissimus Dorsi + Implant	25	30.08	30.885	6.177	17.33	42.83	5	108
Expander	40	4.60	7.452	1.178	2.22	6.98	0	25
Lambou DIEP	16	25.19	17.562	4.391	15.83	34.55	10	72
Total	120	13.75	19.869	1.814	10.16	17.34	0	108

The One-way ANOVA test revealed a statistically significant association ($p < 0.001$) between the type of reconstructive intervention and the timing. Autologous tissue reconstruction was predominantly reserved for patients with delayed breast reconstruction, whereas breast reconstruction with an expander was mostly immediate, with an average duration of approximately 6 months and a minimum value of 0 for immediate reconstructions.

The median period, expressed in months, between mastectomy and reconstruction with DIEP flap was 19 months, and 3 months for expander-based reconstructions. During the doctoral study, 26 immediate reconstructions with an expander and 14 delayed reconstructions were performed. The expander was replaced with a permanent implant in the second stage of the reconstruction. Twenty-one patients underwent symmetrization of the contralateral breast.

Additionally, 17 patients had immediate reconstruction with an implant. In 11 cases, an acellular dermal matrix was used for better positioning of the implant on the chest wall. Considering associated genetic risk factors, five bilateral "nipple-sparing" mastectomies were performed, and the patients received immediate reconstruction with implants. For two patients, the implants were positioned prepectorally.

Twenty-five patients underwent delayed reconstruction with a latissimus dorsi flap and silicone implant, with an average duration of **30.08 months** between mastectomy and reconstruction.

The deep inferior epigastric perforator myocutaneous flap was used as a method of delayed breast reconstruction for 16 patients, with an average duration of **25.19 months** between mastectomy and DIEP reconstruction.

Regarding postoperative complications, among the 120 patients, 26 experienced minor complications such as bruising, hematomas, or wound dehiscence, while 3 encountered major complications, including the exposure of alloplastic materials or partial to total flap necrosis. The correlation between postoperative complications and the reconstructive technique was statistically significant ($p = 0.049$). Patients with expanders or implants had fewer complications compared to those who underwent other reconstructive methods.

The length of hospitalization was also analyzed for the entire cohort. The average hospital stay was **10.09 days**. The ANOVA test indicated a statistically significant correlation between the length of hospitalization and the reconstructive technique ($p= 0.003$). Patients who underwent autologous breast reconstruction required a longer hospitalization period, approximately 13 days, compared to those who had reconstruction with alloplastic materials, who had a hospital stay of about 8 days.

6. Quality of life of patients one year after breast reconstruction

The instruments used to assess quality of life among breast cancer patients include the Short-Form 36 Health Survey (SF-36), the EORTC QLQ-C30 (European Organisation for Research and Treatment of Cancer Questionnaire), as well as specific instruments such as FACT-B (Functional Assessment of Cancer Therapy – Breast Cancer Module) and BREAST-Q [13, 17-19].

The SF-36 is widely used to measure health-related quality of life. It consists of 36 questions and is based on two separate concepts reflecting various aspects of physical and mental well-being. The physical dimension is measured by the Physical Component Summary (PCS) score, while the mental dimension is assessed by the Mental Component Summary (MCS) score, through eight distinct evaluation scales. *Physical health* (PH) is determined by three scales: *physical functioning* (PF), *bodily pain* (BP), and *role-physical* (RP), which refers to limitations due to physical health problems. *Mental health status* (MHS) is reflected in *mental health* (MH), *role-emotional* (RE), which pertains to limitations caused by emotional problems, and *social functioning* (SF). Perceptions of *general health* (GH) and *vitality* (VT) influence both dimensions, determining overall *physical and mental status* (PM) [11, 20-21].

BREAST-Q questionnaire was developed and widely adopted to systematically and objectively evaluate subjective outcomes reported by patients diagnosed with breast cancer. This specific quality of life assessment instrument contains separate modules for various types of breast surgery interventions [22]. The modules and individual scales within the BREAST-Q are independently completed, depending on the objectives of each study [14].

For the research conducted as part of the doctoral thesis, I translated and validated into Romanian the modules related to breast cancer, mastectomy, and breast reconstruction BREAST-Q, maintaining close collaboration with the Q-Portfolio team members since 2020.

BREAST-Q breast reconstruction module includes a total of 25 QoL evaluation scales [23].

The aim of the second study was to assess the quality of life of patients preoperatively and one year after the breast reconstruction procedure. The study is prospective and analytical. It included 63 patients diagnosed with breast cancer who underwent mastectomy and immediate or delayed breast reconstruction using alloplastic materials or autologous tissue in the Plastic Surgery and Reconstructive Microsurgery Clinic of the Emergency Clinical Hospital "Prof. Dr. Agrippa Ionescu" from January 1, 2020, to January 31, 2023.

Quality of life indices were identified using the generic SF-36 instrument before and one year after breast reconstruction. Additionally, the one-year evaluation was conducted using the breast reconstruction module of the BREAST-Q questionnaire.

The average duration between mastectomy and breast reconstruction was calculated to be **15.43 months**, with a range between 0 and 108 months. For 28 patients, a tissue expander was used for breast reconstruction. The latissimus dorsi flap was used in 14 cases, while the DIEP flap was used for 6 patients.

Data Analysis on Quality of Life Using the SF-36 Questionnaire

Results obtained with the SF-36 form showed postoperative improvement regardless of the reconstructive method used, both physically (PF, RP) and in terms of mental health items SF ($p=0.001$), RE ($p=0.021$), and MH ($p=0.018$). For the VT and GH indices, although the postoperative scores were higher, a statistically significant correlation was not demonstrated, as the patients had a preoperative score above 70 (Figure 6.1).

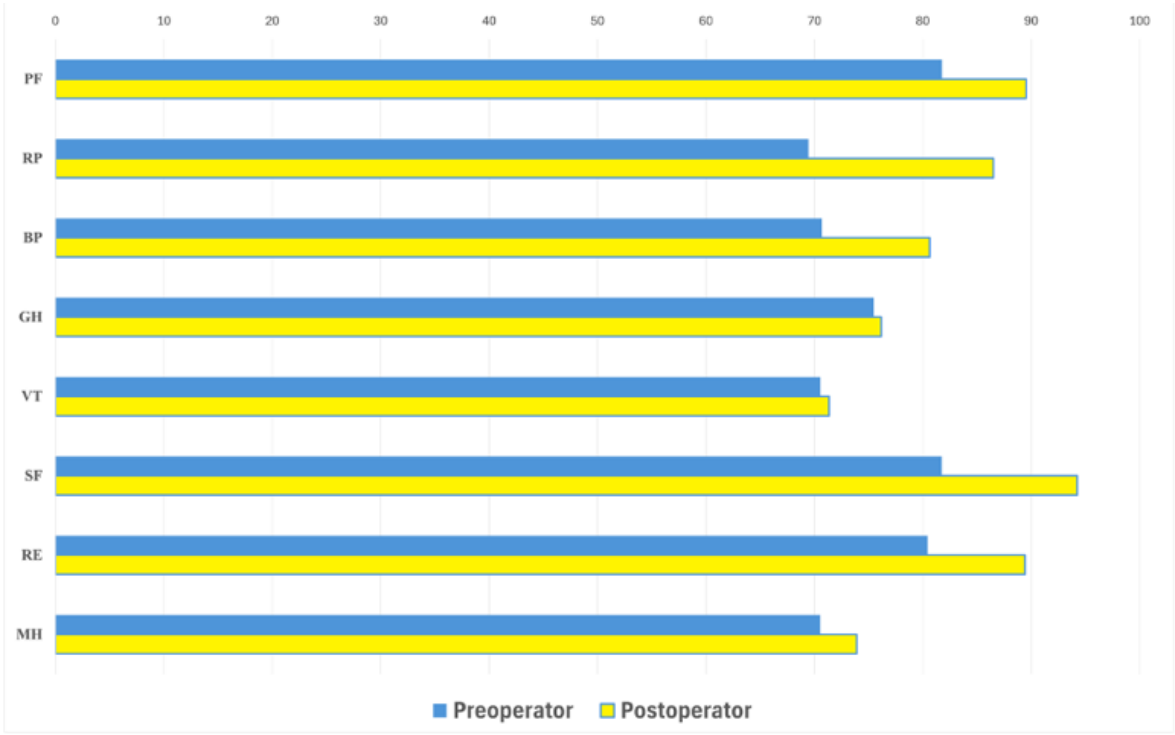

Figure 6.1. Analysis of SF-36 preoperative and postoperative items

Regarding radiotherapy treatment, a significant correlation was identified between patients who underwent radiotherapy and their postoperative physical and mental status - PM ($p=0.048$) and postoperative physical health - PH ($p=0.029$).

Additionally, a statistically significant association was found between preoperative scores for vitality (VT), social functioning (SF), and role-emotional (RE), as well as the cumulative mental health (MH) score, and chemotherapy treatment. The majority of patients underwent preoperative chemotherapy, which influenced vitality, social functioning, and preoperative mental health status.

No correlation was identified between marital status and the PH and PM indices (physical and mental status) evaluated in this study. Patients did not report any change related to the quality of emotional and social life associated with marital status before or after breast reconstruction.

Analysis of Quality of Life Data Using the BREAST-Q Questionnaire

BREAST-Q questionnaire was completed by 14 patients who had direct implant reconstruction, 28 with tissue expander, and 16 with autologous tissue (12 LD and 4 DIEP). Out of the 63 patients included in the study, 5 were unable to complete the online version of the form due to difficulties using the digital platform (Figure 6.2).

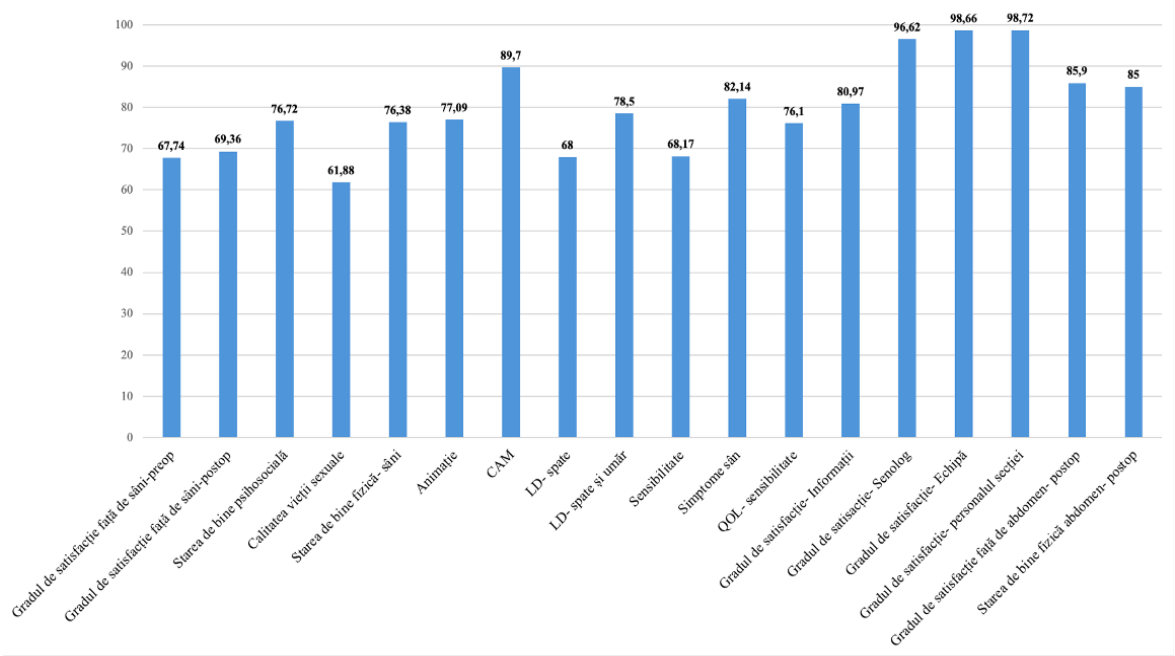

Figure 6.2. Evaluation of QoL using BREAST-Q scales

The satisfaction with breasts was evaluated both preoperatively and postoperatively. The application of the Paired Samples T-Test showed a similar distribution of results, with a mean difference of only 1.621, indicating a slight increase in postoperative satisfaction. This result is relevant considering that 40 patients underwent mastectomy with immediate reconstruction.

The evaluation of psychosocial well-being revealed an average score of 76.72, with 15 patients reporting the maximum score for psychosocial well-being one year after breast reconstruction.

Another essential aspect in evaluating patients' QoL is sexual well-being. The specific scale identified an average score of 61.88. The Kruskal-Wallis test revealed a statistically significant correlation between age and quality of sexual life ($p<0.001$), with patients under 45 years reporting significantly lower values on this scale.

Of the 58 patients, 39 underwent reconstruction of the nipple-areola complex (NAC). 56.4% reported a maximum score of 4, indicating *very high satisfaction* with the final

appearance of the new NAC. Another 13 patients stated they were *satisfied* with the NAC result, while 4 patients reported *some dissatisfaction.*

Using the One-Way ANOVA test, the results of the NAC scale were analyzed with *psychosocial well-being* ($p<0.001$), *sexual well-being* ($p<0.001$), *physical well-being* ($p<0.001$), and *postoperative satisfaction with breasts* ($p<0.001$), resulting in statistically significant correlations.

Using the scale regarding sensation from BREAST-Q and the Kruskal-Wallis test, the impact of radiotherapy on breast sensitivity was highlighted ($p<0.001$). Thus, patients who underwent radiotherapy reported an average sensitivity score of 60, compared to those who did not undergo radiotherapy, who had an average score of 79.

Psychosocial well-being was positively correlated with QoL and a favorable score of symptoms felt in the breast area, with p values of 0.011 and 0.001, respectively. Thus, patients who experience well-being related to the reconstructed breast also have better psychosocial quality of life.

Sexual well-being was positively associated with physical well-being ($p<0.001$), postoperative satisfaction with breasts ($p<0.001$), increased breast sensitivity ($p=0.01$), and symptoms felt in the breast area ($p<0.001$). Thus, the more satisfied the patients are with their reconstructed breasts, the higher is their quality of sexual life (Figure 6.3).

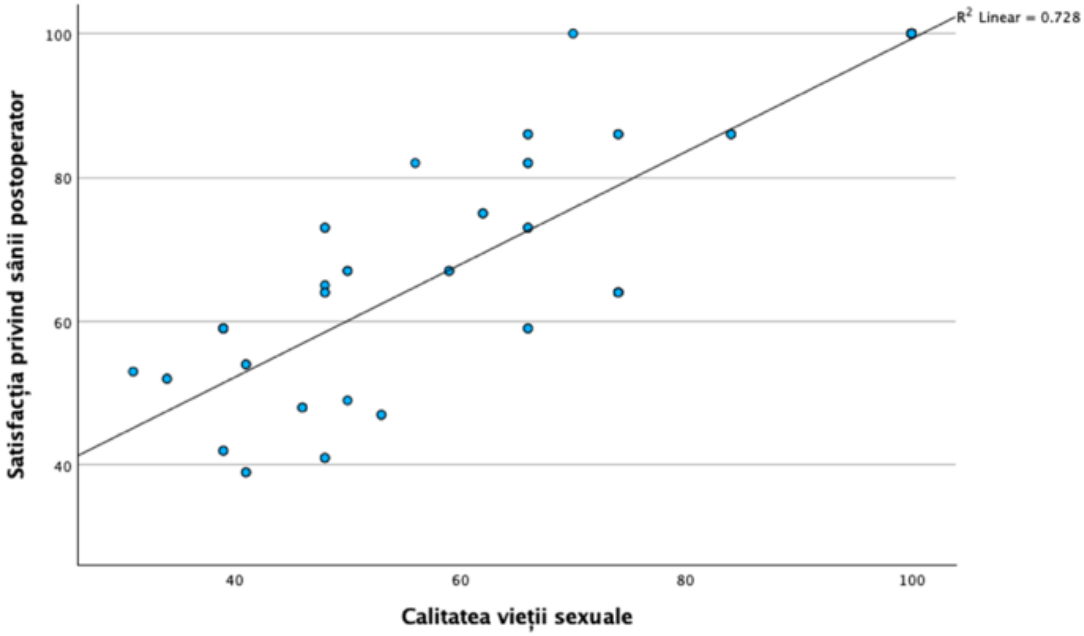

Figure 6.3. Correlation between satisfaction with breast reconstruction and sexual well-being

The patients included in the thesis study who underwent LD reconstruction reported an average satisfaction score of 68 regarding the appearance of their back. While they expressed occasional dissatisfaction with the location and appearance of the scar on their back, the overall result was considered satisfactory, exceeding 65%.

The functionality assessment of the back and shoulder revealed an average score of 78.5, indicating that the patients did not experience functional issues and maintained good physical well-being.

The four patients who underwent DIEP flap reconstruction completed the BREAST-Q scales related to the evaluation of abdominal region functionality and appearance. These patients achieved an average score of 85% for abdominal well-being, indicating that they did not report discomfort or pain in the abdominal area.

An additional aspect evaluated in the study was the patients' satisfaction with their plastic surgeon, the medical team, and the information provided before the reconstructive surgery. Patient satisfaction linked to the plastic surgeon was evaluated through questions focusing on the surgeon's empathy, sensitivity, meticulousness in conducting the anamnesis, provision of preoperative information, and involvement in the postoperative process. The score on this scale was nearly perfect at 96.62%, while the average satisfaction score for the medical team was 98.66%.

7. Conclusions and personal contributions

Conclusions

1. The results of the study indicated an increasing tendency among plastic surgeons to perform breast reconstruction simultaneously with mastectomy. Patients diagnosed at early stages can undergo nipple-sparing mastectomy, which permits immediate reconstruction with an implant. Nonetheless, most reconstructions nationwide are carried out some time after the oncological ablation.

2. The decision regarding the timing and method of the reconstructive intervention must be personalized for each patient, based on a comprehensive medical history, considering the patient's desires as well as the experience of the plastic surgeons.

3. At the Plastic Surgery and Reconstructive Microsurgery Clinic of the Emergency Clinical Hospital “Prof. Dr. Agrippa Ionescu”, immediate reconstruction was performed either by placing the implant retropectorally and covering its lower pole with an acellular dermal matrix, or by positioning a polyurethane-covered implant prepectorally.

4. Among specific breast cancer treatments, radiotherapy significantly influenced the choice of reconstructive methods. For patients who underwent delayed reconstruction after mastectomy and radiotherapy, the use of autologous tissue was decided. The necessity of adjuvant radiotherapy mandated immediate breast reconstruction with a tissue expander.

5. Another important aspect of the first study was determining the length of hospitalization after the reconstructive intervention, an element that inevitably affects patient recovery, costs, and the resources needed for health care. Patients who underwent breast reconstruction with autologous tissue had a longer hospital stay compared to those who had reconstructions with alloplastic materials. Patient satisfaction with the medical team, evaluated through questions about the respect shown by medical staff, their empathy, and professionalism, was extremely high, at 98.66%.

6. The generic SF-36 quality of life assessment tool demonstrated a significant improvement in QoL one year after breast reconstruction, covering aspects of physical, emotional, and social health, regardless of the timing and reconstructive technique used. Postoperative scores obtained through the SF-36 form were significantly higher compared to preoperative evaluations, highlighting the importance of reconstructive procedures after mastectomy.

7. In Romania, the quality of life evaluation for breast cancer patients who have undergone oncological resection and breast reconstruction has not been specifically conducted due to the lack of a measurement instrument like BREAST-Q. The quality of life assessment using the BREAST-Q questionnaire, which has now been translated and validated in Romanian, represents the first national study aimed at analyzing the positive impact of reconstructive interventions.

8. Data obtained through BREAST-Q scales indicated that patients who underwent delayed breast reconstruction after oncological excision of the breast reported a very high level of satisfaction. This highlights the importance of promoting reconstructive interventions among all breast cancer patients who have undergone mastectomy, as these interventions have a clearly positive impact on their quality of life.

9. An essential parameter evaluated through BREAST-Q, impacting QoL, is the sensitivity of the reconstructed breast. The study results indicated that breast sensitivity was over 70% for reconstructions using alloplastic materials. Patients who underwent DIEP flap reconstruction had a considerably lower average sensitivity score of 38.5%. This indicates the necessity of microsurgical transfer of an innervated DIEP flap to improve local sensitivity.

10. The sexual well-being was positively associated with physical well-being, postoperative breast satisfaction, breast sensitivity, and symptoms experienced in the breast area. Thus, higher satisfaction with the reconstructed breasts corresponds to a higher quality of sexual life.

11. The reconstruction of the nipple-areola complex, the final stage of reconstruction, is vital, significantly enhancing satisfaction with the reconstructed breast.

12. Age was identified as an important factor in evaluating quality of life through both the SF-36 form and BREAST-Q, with younger patients under 45 reporting significantly lower results. This is particularly important for multidisciplinary teams to understand how to approach patients whose diagnosis of breast cancer and associated treatments have significantly impacted their personal and professional lives.

13. The therapeutic plan for patients diagnosed with breast cancer should be established by the hospital's oncology committee, which includes an oncologist, radiotherapist, general surgeon, plastic surgeon, pathologist, radiologist, medical geneticist, and psychologist. Therefore, it is of utmost importance that, in 2024, hospitals in Romania where these patients are treated and operated on have multidisciplinary teams to establish appropriate therapeutic management in accordance with international guidelines.

In conclusion, the results obtained from the first integrative study in Romania, using two quality of life assessment tools, highlighted the importance of breast reconstruction after oncological resection in the physical, psychosocial, and familial recovery of patients. Additionally, these results emphasize the necessity for a detailed evaluation of patient-reported outcomes through BREAST-Q, as they significantly contribute to the improvement of clinical and surgical practices, as well as to research and advancements in public health.

Personal contributions

The originality of the thesis lies in integrating the health-related quality of life results reported by patients undergoing breast reconstruction, obtained through the generic SF-36 tool, with the analysis of the impact of reconstructive intervention using the BREAST-Q scales, which was distributed for the first time in Romania.

The initial objective of the doctoral research thesis was to evaluate the quality of life of patients after breast reconstruction using the generic SF-36 tool.

In 2020, I contacted the Q-Portfolio team (qportfolioteam@gmail.com) to obtain the reconstructive module from the BREAST-Q, a specific instrument for assessing the quality of life of breast cancer patients, currently used in international research projects and studies on this topic. As the questionnaire was in English, to make it accessible to patients in Romania, I initiated the academic translation of the BREAST-Q scales, using the corresponding drafts from the Q-Portfolio team. The process was lengthy, considering the SARS-CoV-2 pandemic, and included both back-translation from Romanian to English and the validation of the scales, achieved by distributing them to 10 patients. The final version of the BREAST-Q questionnaire in Romanian was systematized and structured by the American team that created it and is available to all researchers in Romania who contact Q-Portfolio. In January 2024, I translated the three newest scales from the BREAST-Q, which will be distributed to patients starting from October 1, 2024.

In addition to the reconstructive module, I translated also the breast cancer-specific module and the mastectomy module. Thus, the BREAST-Q can now be used in Romania as a research and evaluation tool by both oncologists and general surgeons who perform breast ablation surgeries. This highlight once again the importance of multidisciplinary management for breast cancer patients.

The conducted study represents a crucial reference point for public health in Romania, being the first of its kind in the country. The preoperative evaluation and the assessment one year after the final reconstructive intervention provided a detailed picture of the impact of breast reconstruction on patients' quality of life. The ultimate goal of QoL assessment is to ensure long-term monitoring for all breast cancer patients, thereby offering them the chance for an improved and less traumatic life. Through breast reconstructive surgery, we can provide women diagnosed with breast cancer the opportunity to regain their confidence and self-esteem, while also ensuring better psychosocial integration.

The doctoral study will be the starting point for a multicenter study involving Plastic Surgery Clinics affiliated with the National Breast Reconstruction Program. This initiative will ensure that each patient receives an appropriate, coordinated, and staged therapeutic plan, helping them to regain confidence, hope, and the "*gioia di vivere*" that will support their forward journey.

I aim to continue research in the field of quality of life evaluation, as this is vital both to optimize methods of mammary gland ablation and reconstruction techniques, and to improve postoperative support so that all patients can receive the best possible care and recovery. I am confident that together with my colleagues, we will succeed in improving the quality of life for an increasing number of patients.

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