

Evaluation of quality of life in women with breast cancer, with particular emphasis on sexual satisfaction, future perspectives and body image, depending on the method of surgery

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Summary

Introduction. Both because of the large number of women undergoing surgery and a high cure rates, psychological rehabilitation of the consequences of breast cancer and side effects of their treatment is a major challenge of modern psycho-oncology.

Aim. The study analyzed the quality of life in women with breast cancer, with particular emphasis on indicators of sexual satisfaction, future perspectives and body image, depending on the method of surgery.

Method. The study included 42 women aged 35–70 years, 3 months after surgery due to early breast cancer, treated with adjuvant chemotherapy. The following research tools were used in the study: two EORTC questionnaires: QLQ-C30, BR23, and sexual function questionnaire: PL-FSFI.

Results. There was no significant difference in the overall quality of life, depending on the type of surgery. The greatest local complaints were reported by patients after breast conserving surgery (BCT) with axillary lymphadenectomy. A higher level of cognitive functioning but a greater severity of systemic side effects was found in women undergoing mastectomy compared to BCT-patients. Women who underwent surgery of the right breast reported increased problems in sexual functioning ($p = 0.034$). Multiple regression analysis showed a positive correlation of the emotional functioning variable with the assessment of future perspectives ($p = 0.01$) and body image ($p = 0.007$).

Conclusions. The type of surgical technique does not affect the overall quality of life and sexual satisfaction. Problems with memory and attention do not correlate directly with the side effects, and as such require an independent diagnostics. Women undergoing treatment of

the dominant-side breast should be the candidates for sexology consultation. There is a risk of disturbances in the body image and in the assessment of future perspectives in patients with emotional disorders observed within 3 months after surgery.

Key words: breast cancer, quality of life, sexual satisfaction

Introduction

Breast cancer is the most common cancer in women in Poland. In recent years, according to the National Cancer Registry, the number of cases during the year exceeded 16,500 and increased in the past two decades by approx. 10,000. In Poland, breast cancer is, for several years, the second, after lung cancer, cause of death by cancer among women (the number of deaths – approx. 5,500 a year) [1, 2]. The disease itself and its mental and social aftermath can have a significant impact on the current quality of life in the affected women [3]. Surgical procedures performed within the breast also interfere in and violate the specific, not only in terms of the aesthetics, but also in terms of the symbolism, area of women's identification. Especially mastectomy involves stress, sometimes the feeling of shame and embarrassment, and a sense of loss of value (i.e., half woman complex) [4]. Studies of psychological context and psychosocial consequences of mastectomy already have a long history; however, due to continued progress in both surgical techniques and changes in the understanding of the psychological mechanisms that differentiate the quality of life and functioning of women with breast cancer, the analysis of these issues is consistently very popular. Among these studies, significant group involve the analysis of social, professional and sexual life, as well as the body image, both in the subjective dimension and the appearance of the studied women in the social perception [5, 6]. Considering the above data, the authors of this paper undertook a prospective analysis of the quality of life, body image, side effects of treatment, sexual satisfaction and future perspectives in the group of women diagnosed with early breast cancer, depending on the method of surgery. The presented results represent a fragment of a wider research project conducted in the Department of Gynecologic Oncology of the Jagiellonian University Medical College, and the Department of Oncology of the Jagiellonian University Medical College under the title: "Subjective body image – 'Body self' and the level of sexual satisfaction in women undergoing gynecological and oncological surgery". The study was approved by the Jagiellonian University Bioethics Committee.

Aim of the study

The aim of this study was to answer the following questions:

1. Is the type of surgical technique associated with the overall quality of life and with the level of sexual satisfaction of women treated for breast cancer?
2. Are demographic, medical and psychological variables related to body image in women with breast cancer?
3. Are demographic medical and psychological variables related to the sexual satisfaction of studied women?

Material and methods

The presented results are the development of the first stage of the prospective research. This research assumes that the patients undergoing surgery due to breast cancer and receiving adjuvant systemic cytostatic treatment, will fulfill twice (3 and 6 months after the surgery) the following questionnaires: quality of life questionnaires (EORTC-QLQ-C30 and QLQ-BR23), sexual function questionnaire (PL-FSFI), body image – “body self” questionnaire developed by Beata Mirucka and sense of coherence questionnaire (SOC-29) developed by A. Antonowski. This work was based on the analysis of data obtained from the first three of the above-mentioned questionnaires, collected 3 months after the surgery. This is a cross-sectional analysis of a fragment of the obtained data. In the future, it is planned to perform the analysis of the remaining data, with reference of the results to the control group and to perform the prospective analysis that assumes a comparison of results obtained 3 and 6 months after the surgery.

The study included women aged 18–65 years, with early breast cancer after the initial surgery due to the invasive breast cancer that required adjuvant chemotherapy after surgery (without evidence of generalization of the cancer in imaging studies). The women with the clinical advancement corresponding to IV degree, which is the presence of metastatic changes, or patients who did not undergo surgery, e.g., due to poor general condition, inflammatory breast cancer, or advanced age, were excluded from the study. 49 women subsequently undergoing surgery in the period from March to December 2015 met the inclusion criteria. 5 out of the qualified women refused to participate in the study, while 2 patients did not return their questionnaires despite the consent to participate in the study. Finally, observation and analysis included 42 women.

Group characteristic

The youngest patient was 36 years old and the oldest was 68 years old, the median was 56 years. The majority (59.5%) of respondents were residents of large cities (population > 300,000), with a slight predominance of persons with secondary education (35.7%). BMI (body mass index) of the patients was calculated and it ranged from 16.5 to 38 (median 26.7). 64% of women reported, in an interview, a presence of additional internal diseases (hypertension, ischemic heart disease, thyroid disease, lung diseases, and diabetes). General characteristic of the group is presented in Table 1.

Table 1. The general characteristics of the study group

	Number (n)	Percentage (%)
Place of residence:		
City	25	59.5
Town	8	19.0

table continued on the next page

Village	9	21.4
Education:		
Higher	13	31.0
Secondary	15	35.7
Vocational	10	23.8
Primary	4	9.5
Comorbid internal diseases	27	64.3

All women included in the research underwent the surgery due to breast cancer. Depending on indications, the studied patients underwent one of the four variants of surgery. The most common (33.3%) was breast conserving therapy with sentinel lymph node biopsy (BCT + SNB). Other methods included breast conserving therapy with axillary lymph node dissection (BCT + ALND) and mastectomy with sentinel lymph node biopsy or with axillary lymph node dissection (M + SNB or M + ALND). The need for re-operation in order to increase margins after the initial quadrantectomy occurred in the case of six patients (14.9%), including five patients after breast conserving therapy with sentinel node biopsy (BCT + SNB). Breast reconstruction after a mastectomy (two simultaneous and two deferred ones) was performed in 4 women, with deferred ones carried out after completing the questionnaires. Depending on the technical possibilities and the need to perform a second surgery (ALND after SNB), the women had one scar (removal of the tumor and the lymphatic system in one surgery) or two scars. All patients included in the study after the surgery received adjuvant chemotherapy based on regimens containing anthracyclines, in a similar dose range and non-differentiating profile of the potential side effects. Table 2 summarizes the parameters of the performed surgical procedures.

Table 2. The types of breast surgery (breakdown by the side of surgery and breast size before the surgery)

	Number (n)	Percentage (%)
Type of surgery:		
BCT + SNB	14	33.3
BCT + ALND	9	21.4
M + SNB	10	23.8
M + ALND	9	21.4
Breast:		
Right	15	35.7
Left	27	64.3
Breast size:		
Cup A	1	2.5

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Cup B	10	25
Cup C	16	40
Cup D	6	15
Cup E	7	17.5

Note: Descriptions of abbreviations are presented in the text.

Diagnostic scales used in the study

The following questionnaires were used in order to determine the correlation between the used method of breast cancer treatment, medical variables and the presence of side effects of surgery and the quality of life, body image, sexual satisfaction and the evaluation of the future in the group of women after breast surgery:

1. Standardized questionnaire EORTC (The European Organization for Research and Treatment of Cancer) QLQ-C30 (version 3.0) for the evaluation of the quality of life in cancer patients. The researchers obtained the written consent for the use of EORTC questionnaires. QLQ-C30 is used to assess the subjective sense of health and to assess the functioning in physical, emotional and social dimension. It contains 30 questions grouped into five functional subscales: physical functioning (5 questions), functioning in the life roles (2 questions), emotional functioning (4 questions), cognitive functioning (2 questions), and social functioning (2 questions). It also contains 3 scales of symptoms evaluating respectively: fatigue (3 questions), nausea and vomiting (2 questions), and pain (2 questions), and 6 individual questions assessing the intensity of the following symptoms: dyspnea, insomnia, loss of appetite, constipation, diarrhea and financial difficulties. The last two questions are related to overall health assessment. Responses to the questions included in the questionnaire are marked on a 4-point scale (1 – “never”, 2 – “sometimes”, 3 – “often”, 4 – “very often”) assessing the severity of the analyzed parameters [7–9];
2. The Quality of Life Questionnaire for Breast Cancer (EORTC QLQ-BR23) is an extension of QLQ-C30 questionnaire designed for the study of women with breast cancer. It includes five scales. Two of them are related to the functional status: body image – 4 questions (BI; 9–12), and sexual functioning – 2 questions (SEF; 14, 15). Three scales assess side effects of therapy – 7 questions (ST; 1–4, 6–8), breast symptoms – 4 questions (BS; 20–23), arm symptoms – 3 questions (AS; 17–19). There are also three single questions referring to: sexual enjoyment (SEE; 16), worrying about health in the future (FU; 13) and worrying about hair loss (HL; 5) [7–10]. All of these scales have been recoded from raw results to range 0–100 points, so that the higher the value obtained on the scale means a higher intensity of the studied feature. The content of the questions forming the used version the questionnaires is available on the EORTC website [7]. The researchers obtained a written consent to use the EORTC questionnaire in the study.

3. Female Sexual Function Index (FSFI) in the Polish language version PL-FSFI is used for screening assessment of sexual functioning of women [11, 12]. The researchers obtained a written consent of the authors of the Polish version for the application of the questionnaire in the study. PL-FSFI includes 19 questions concerning the core emotional and physiological areas of sexual contact during the preceding four weeks. It takes into account 6 domains of a sexual contact: desire (questions 1 and 2), agitation (questions 3–6), lubrication (questions 7–10), experiencing orgasm (questions 11–13), satisfaction with sexual and emotional relationship with a partner (questions 14–16), and pain during vaginal intercourse (questions 17–19). Point values, which make up the total score on a scale of 2.0 to 36.0, are assigned to individual responses.

The patients completed the questionnaires in 3rd month after the surgery, during chemotherapy, depending on the treatment regimen, after 2nd or 3rd series. Each patient answered additional questions on demographic data: education, occupation, place of residence, breast size before surgery (cup size from A to E) and a subjective evaluation of the appearance of the scars after the surgery (possible variants of assessment: good, average, bad, I have no opinion).

Results

The statistical analysis was performed using Statistica 12.5. The analyses of independent variables presented below were carried out using Mann-Whitney U test and multiple regression method. In the study population, average overall quality of life was 59.52. Juxtaposition of the results of EORTC QLQ-C30 and QLQ-BR23 are presented in Table 3 and 4.

Table 3. The results of QLQ-C30 in women after breast surgical treatment

QLQ-C30	n	Mean	Standard deviation	Median	Minimum	Maximum
Functional scales*						
Physical functioning	42	70.87	19.76	73.33	20	100
Roles (job/family)	42	66.67	29.90	66.67	0	100
Emotional functioning	39	66.24	23.80	66.67	0	100
Cognitive functioning	39	70.51	28.98	66.67	0	100
Social functioning	38	71.05	28.92	83.33	0	100
Overall quality of life (QoL)	42	59.52	21.51	58.33	8.33	100
Symptom scales**						
Fatigue	42	42.53	21.56	38.83	0	88.66
Nausea and vomiting	42	16.27	18.22	16.67	0	66.67
Pain	42	26.98	29.21	16.67	0	100
Dyspnea	41	24.39	33.35	0	0	100

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Sleep disturbances	42	46.83	36.11	33.33	0	100
Appetite loss	42	19.44	22.67	0	0	66.67
Constipations	39	30.77	27.98	33.33	0	100
Diarrhoea	39	9.40	17.01	0	0	66.67
Financial difficulties	38	26.32	30.17	33.33	0	100

* The higher values indicate higher level of functioning and quality of life; min: 0, max: 100;

**The higher values indicate a greater severity of symptoms, min: 0, max: 100.

Table 4. The results of QLQ-BR23 in women after breast surgical treatment

QLQ-BR-23	n	Mean	Standard deviation	Median	Minimum	Maximum
Functional scales *						
Body image	42	64.71	31.55	67	0	100
Sexual functioning	35	12.80	17.09	0	0	50
Sexual enjoyment #	12	44.42	21.96	33	0	67
Future perspectives	42	31.76	32.15	33	0	100
Symptom scales **						
Side effects of treatment	42	41.93	18.20	43	5	78
Breast symptoms	42	20.93	21.68	17	0	78
Arm symptoms	42	21.98	22.99	17	0	100
Hair loss ###	37**	54.84	40.30	33	0	100

21 cases were not applicable (NA); ### 3 cases were not applicable (NA); * The higher values indicate higher level of functioning and quality of life, min: 0, max: 100; ** The higher values indicate a greater severity of symptoms, min: 0, max: 100

There was no significant correlation between the type of surgery (BCT + SNB, BTC + ALND, M + SNB, M + ALND) and the overall average quality of life in the women measured using EORC-QLQ-C30. There was also no relation between the side of the surgery and the average overall quality of life in the women. However, a significant difference in terms of certain somatic complaints (QLQ-BR23 symptom scales) related to the breast, depending on the type of performed surgery was observed. The lowest severity of symptoms was reported by patients after mastectomy with axillary lymph node dissection (M + ALND), then after breast conserving surgery with sentinel lymph node biopsy (BCT + SNB) and mastectomy with sentinel lymph node biopsy (M + SNB). The greatest severity of symptoms was reported by patients after breast conserving surgery with axillary lymph node dissection (BCT + ALND). This difference was statistically significant ($p = 0.0287$). Detailed results are presented in Table 5.

Table 5. The severity of breast symptoms depending on the method of surgical treatment

QLQ-BR23	Type of surgery	n	Mean*	SD	Me	Min	Max	Kruskal-Wallis ANOVA
Breast symptoms	BCT + SNB	14	18.93	17.98	17.00	0.00	58.00	p = 0.0287
	BCT + ALND	9	30.56	27.40	17.00	0.00	75.00	
	M + SNB	10	28.20	23.09	23.50	8.00	78.00	
	M + ALND	9	6.33	10.72	0.00	0.00	33.00	

* The higher values indicate a greater severity of the breast symptoms, min: 0, max: 100

A relationship between the type of surgery and cognitive functioning and severity of systemic side effects of treatment was observed. Women after mastectomy were characterized by better cognitive functioning, at the same time reporting less severe systemic side effects of treatment than women after breast conserving surgery, and these relationships were statistically significant (Table 6).

Table 6. Cognitive functioning and the side effects of systemic therapy in QLQ-C30 and QLQ-BR23 according to the type of surgery

QLQ-C30	Type of surgery	n	Mean	SD	Me	Min	Max	Mann-Whitney U test
	Functional scales*							
Cognitive functioning	BCT	23	61.90	29.41	66.67	0.00	100.00	p = 0.026
	M	19	80.56	25.72	91.67	16.67	100.00	
QLQ-BR-23	Type of surgery	n	mean	SD	Me	min	max	Mann-Whitney U test
	Symptom scales**							
Side effects of systemic treatment	BCT	23	48.87	16.73	48.00	24.00	78.00	p = 0.008
	M	19	33.53	16.61	29.00	5.00	61.00	

BCT – breast conserving therapy; M – mastectomy; * The higher values indicate higher level of functioning and quality of life, min: 0, max: 100; **The higher values indicate a greater severity of symptoms, min: 0, max: 100)

There were differences in the subjective assessment of the appearance (aesthetics) of the scar on the scale: good – average – bad – irrelevant, depending on the level of cognitive functioning, emotional functioning and functioning in social relations (family and social) of the studied women. The patients who assessed the scar the lowest – as “bad” also assessed their functioning in all the above areas as the lowest. In contrast, women who reported fewer problems in the cognitive, emotional and social functioning assessed the scar as neutral (average, irrelevant) or positive (good). These relationships were statistically significant (Table 7).

Table 7. The cognitive, emotional and social dysfunctions reported in subscales of QLQ-C30, in the context of the subjective assessment of the aesthetics of postoperative scar tissue within the breast

QLQ-C30	Assessment of scar	n	Mean*	SD	Me	Min	Max	Kruskal-Wallis ANOVA
Cognitive functioning	good	21	67.46	29.57	66.67	0.00	100.00	p = 0.0325
	average	6	80.56	16.39	75.00	66.67	100.00	
	bad	4	41.67	21.52	41.67	16.67	66.67	
	irrelevant	8	85.42	28.78	100.00	16.67	100.00	
Emotional functioning	good	21	65.48	23.90	66.67	0.00	100.00	p = 0.041
	average	6	70.83	19.54	66.67	41.67	100.00	
	bad	4	37.50	19.84	37.50	16.67	58.33	
	irrelevant	8	79.17	17.82	79.17	50.00	100.00	
Social functioning	good	21	63.33	27.89	66.67	0.00	100.00	p = 0.0334
	average	6	86.11	16.39	91.67	66.67	100.00	
	bad	4	50.00	43.03	50.00	0.00	100.00	
	irrelevant	8	89.58	17.68	100.00	50.00	100.00	

* The higher values indicate a greater degree of symptoms, min: 0, max: 100

There were also differences in the assessment of the scar depending on the size of financial difficulties and the degree of loss of appetite in the studied women. Women who had reported the greatest financial difficulties most often assessed the scar as bad. Women who had assessed their financial situation better assessed the aesthetic value of the scar as neutral (average, irrelevant) or positive (good). This relationship was statistically significant ($p = 0.0069$). The relationships between the assessment of the scar and the degree of loss of appetite were similar; these relationships were also statistically significant ($p = 0.0444$) (Table 8).

Table 8. Aesthetic evaluation of the scars by women after breast surgery in the context of financial difficulties reported in QLQ-C30

QLQ-C30	Assessment of scar	n	Mean*	SD	M	Min	max	Kruskal-Wallis ANOVA
Symptom scales								
Financial difficulties	good	20	25.0	30.3	33.3	0.0	100.0	p = 0.006
	average	6	22.2	17.2	33.3	0.0	33.3	
	bad	4	75.0	16.6	66.6	66.6	100.0	
	irrelevant	8	8.3	15.4	0.0	0.0	33.3	
Loss of appetite	good	21	19.0	22.5	0.0	0.0	66.6	p = 0.044
	average	6	16.6	27.8	0.0	0.0	66.6	
	bad	5	43.3	14.9	33.3	33.3	66.6	
	irrelevant	8	8.3	15.4	0.0	0.0	33.3	

* The higher values indicate a greater severity of symptoms, min: 0, max: 100

There were no correlations between indicators of sexual satisfaction measured by PL-FSFI and the overall quality of life ($p = 0.1388$), as well as between PL-FSFI and symptom scales and functional scales measured by QLQ-C30. The type of surgical procedure did not influence the sexual functioning and sexual satisfaction assessed by means of PL-FSFI and QLQ BR-23 subscale. In the Mann-Whitney U test, there were no differences between the results of PL-FSFI and the operation side. However, a relationship between the results of the QLQ BR-23 subscale “sexual functioning” and the side of surgery was observed. Women after left breast surgery reported a statistically significantly lower ($p = 0.034$) severity of problems in sexual functioning than women after right breast surgery. This observation can be seen in the context of the information that probably most of the studied women were right-handed (Table 9).

Table 9. Sexual functioning of women depending on side of the breast surgery

QLQ-BR-23	Breast	n	Mean*	SD	Me	Min	Max	Mann-Whitney U test
Functional scale								
Sexual functioning	left	22	17.3	18.0	17.0	0.0	50.0	p = 0.034
	right	13	5.0	12.3	0.0	0.0	33.0	

*The higher values indicate better functioning, min: 0, max: 100

Multiple regression analysis showed a significant positive correlation between the variable “emotional functioning” (QLQ-C30 questions 21–24) and the assessment of future perspectives ($p = 0.01$) as well as with the assessment of the body image of the studied women ($p = 0.007$) (Table 10 and 11). Multiple regression analysis of analogical model of independent variables for indicators of sexual functioning and sexual satisfaction did not obtain statistically significant model.

Table 10. Multiple regression model of the impact of the components of quality of life for the assessment of the future perspectives

Model components	Summary of regression of dependent variable: future perspectives; $p = 0.04051$					
	b*	b stand. err.*	b	b stand. err.	t(28)	p
Physical functioning	0.374	0.262	0.586	0.412	1.424	0.166
Functioning in life roles	0.252	0.257	0.254	0.259	0.981	0.335
Cognitive functioning	-0.033	0.249	-0.036	0.267	-0.134	0.894
Emotional functioning	0.700	0.256	0.914	0.334	2.739	0.011
Social functioning	-0.278	0.241	-0.303	0.263	-1.153	0.259
Overall quality of life	-0.072	0.248	-0.102	0.351	-0.290	0.774
Fatigue	0.333	0.378	0.474	0.537	0.881	0.386
Nausea and vomiting	-0.073	0.212	-0.120	0.348	-0.344	0.733
Financial difficulties	-0.067	0.185	-0.070	0.193	-0.364	0.7185

* The positive results – describe the positive correlation. The negative results – describe the negative correlation; $p < 0.05$

Table 11. **Multiple regression model of the impact of the components of quality of life on the body image**

Model components	Summary of regression of dependent variable: body image; $p = 0.0105$					
	b*	b stand. err.*	b	b stand. err.	t(28)	p
Physical functioning	0.20248	0.24626	0.324	0.3940	0.82223	0.41788
Functioning in life roles	-0.05229	0.24088	-0.053	0.2477	-0.21711	0.82969
Cognitive functioning	-0.05581	0.23347	-0.061	0.2553	-0.23905	0.81280
Emotional functioning	0.698452	0.239923	0.9301	0.31951	2.911145	0.006990
Social functioning	0.01190	0.22626	0.013	0.2513	0.05263	0.95839
Overall quality of life	-0.01708	0.23285	-0.024	0.3367	-0.07338	0.94202
Fatigue	0.48344	0.35457	0.701	0.5144	1.36345	0.18360
Nausea and vomiting	-0.10130	0.19860	-0.169	0.3326	-0.51011	0.61396
Financial difficulties	-0.12992	0.17394	-0.138	0.1851	-0.74689	0.46135

* The positive results – describe the positive correlation. The negative results – describe the negative correlation; $p < 0.05$.

Discussion

In common perception, women's breasts are not only the mammary gland, but also an object associated with femininity, sexuality, motherhood and attractiveness of women [13]. Therefore, both breast cancer and its treatment can significantly affect not only the somatic health of a woman, but also the quality and style of her life, sexuality and experiencing of the body [14]. The removal of the breast and functionally related parts of the lymphatic system can cause many anatomical and physiological disorders. These include lymphatic obstruction of limbs, muscle weakness, limited range of motion in arm, posture defects. All of these disorders can cause the sensation of pain, difficulties in lifting objects, which can result in limitations in daily functioning [14, 15]. Many authors also agree that the removal of the breast in a woman has a major impact on her emotional, social and family sphere [13, 16]. Despite progress in the diagnosis and treatment of breast cancer, breast cancer patients still experience problems in different areas making up their subjective feeling of quality of life. Therefore, examination of the quality of life in women with breast cancer and the resulting further attempts to optimize the therapeutic procedures seem to be still valid [17]. The results of the overall quality of life in women obtained in this study equal to 59.52 and do not differ significantly from the results presented by other authors [10, 17]. In Polish conditions, the standard treatment for breast cancer, in the absence of medical indications for mastectomy (e.g., multifocal neoplastic process, contraindications to radiation therapy, a large tumor not qualified for the neoadjuvant treatment, genetic load), is breast conserving treatment. Finally, the choice of method of treatment is a joint decision of the

surgeon and the patient, including medical indications, the effects of surgery for the quality of life and patient's preferences [18]. Some authors, who observed a correlation between the type of surgery and functioning in family and social life (QLQ-C30 scale "social functioning") have reported that women after mastectomy report less problems in this area in comparison to women after breast conserving surgery (BCT) [19]. This study did not confirm this association. The analysis of our data shows that the used surgical technique, regardless of their scope and the side of surgery, does not differentiate study group in terms of the overall (global) quality of life (Global health status – QoL) or in terms of sexual satisfaction indicators. This observation is consistent with the results of other researchers [20–22].

In the era of the availability of breast reconstruction, mastectomy seems, therefore, to be a good method for patients with indications for surgery radicalization, especially in the context of the above observations about the lack of significant differences between mastectomy and breast conserving treatment both for the overall quality of life and sexual functioning of women. In the studied group the relationship between the type of surgery and the intensity of local breast symptoms was observed, however, contrary to the expectations, breast conserving treatment was the cause of greater severity of symptoms in the studied women more often than mastectomy. In the case of mastectomy, there usually is a linear scar on the chest wall, with a certain amount of subcutaneous tissue. In the case of breast conserving treatment, there remains well supplied with blood and innervated part of the breast, which is a potential source of discomfort and pain, swelling and tenderness, which hypothetically could explain the occurred observation. In the analyzed population, a combination of breast conserving treatment and axillary lymph node dissection was related to the highest risk of local ailments, which is not consistent with the results of other authors who indicate that greater severity of the upper limb symptoms and breast symptoms occurs in women after mastectomy [23]. The dependence observed in this study may result from the fact, that in some cases breast conserving treatment with axillary lymph node dissection is performed in two stages. The first stage of the procedure is sentinel node biopsy, and only in a situation of risk factors, axillary lymph node dissection is performed in the second stage of the treatment. Whether these results are dependent on the performance of the two procedures rather than one surgery remains a hypothesis requiring verification in the course of further research.

Data from the literature suggest the importance of cognitive functions of women with breast cancer, especially to adequately assess their future perspectives (prognosis) by themselves [24]. In the studied group, patients who underwent mastectomy are characterized with higher rates of cognitive functioning (fewer problems with memory and concentration of attention) despite reporting more severe systemic side effects of treatment than women after breast conserving surgery. However, no significant correlation between the cognitive functioning of the studied women (QLQ-C30 functional scale) and the assessment of future perspectives reported in the QLQ-BR23 was observed. Numerous studies of women after mastectomy are related to the image and perception of the body. Montazeri et al. and Arora et al. studied prospective quality of life in patients after surgical treatment for breast cancer. They

showed that there are significant differences in the prospective assessment of the body image in the operated women. In the cited studies, despite the improvement of general physical condition and recovery from symptoms after systemic treatment, there was a significant deterioration of perception of their own body by the studied women [25, 26]. The study conducted by Pytka and Spych indicates that the decreased perception of own body aesthetic and discomfort with own body occur in 32% of surveyed women after amputation of the breast. These findings are comparable with the results of Niechwiadowicz-Czapka and Klimczyk [14, 20]. Our study did not show the effects of demographic variables or type of surgery on the body image of the studied women (scale of functioning in QLQ-BR23, questions 9–12). This observation is consistent with the results of other authors [27]. However, in the studied group of women a diverse assessment of the aesthetic of the scar was observed. What differentiated the study population in terms of assessing the aesthetics of the scar was the level of cognitive, emotional and social functioning of the studied women in 3rd month after the surgery. The direction of this relationship indicates that women who were characterized by the lowest level of functioning in each of the three areas assessed the aesthetic value of the scar as bad, while women with a higher level of functioning (cognitive, emotional and social) avoided definitely negative assessment of the scar. It is difficult to conclude about the cause of this dependence. Hypothesis that the co-occurrence of symptoms, the severity of which is described in questions 20–27 of functional scale of the QLQ-C30, such as: difficulty with concentrating and memory problems, mental tension and irritability, worrying and depression, disruption of family and social life, and the negative assessment of the appearance of the scar, reflects depressive way of thinking, experiencing and perceiving the environment present in the studied women, seems to be probable. What is more, a negative assessment of the scar is accompanied by another somatic symptom of depression observed in this context – loss of appetite.

Other authors observed that women after mastectomy are generally more likely to experience financial difficulties than women after breast conserving surgery [21]. In the studied population of women, the type of surgery did not differentiate the group in terms of financial difficulties. The level of financial difficulties, however, differentiated women in terms of assessing the appearance of the scar. Those women who assessed the scar as bad also reported the greatest financial difficulties. Direction of the relationship may suggest that a better financial situation favors a neutral or a positive assessment of the appearance of the scar and poor financial situation favors clearly negative assessment of the scar. Perhaps this results from the fact that a better financial situation as an additional psychological resource shapes a more positive assessment of the health status of the patients, including assessment of the aesthetic of the scar. This observations can be seen in the context of data indicating that undergoing surgery significantly worsens the involvement of women in professional career (only about 24% of women remains professionally active during treatment), which may reduce their ability to fundraising [14, 28, 29]. It also seems very likely that in a situation where there are some restrictions in financing aesthetic and plastic treatments from public funds, women with a larger financial capacity give less importance to the aesthetic

of the scar in 3rd month after the surgery, with a chance to self-finance its aesthetic adjustments in the future. However, on the basis of the obtained data we cannot clearly conclude on the cause of the observed dependence.

In the analysis of sexual functioning of women treated for breast cancer, the authors emphasize that about 78–88% of women experience a decrease in satisfaction with sexual activity, as the negative effect of cancer and the administered treatment [21, 25–26, 28–31]. Arrora et al., examining the quality of life after surgical and systemic treatment observed that sexual functioning was significantly poorer in women undergoing systemic treatment compared with women undergoing surgical treatment only [26]. Other studies describe a significant correlation between sexual dysfunction and lower sexual activity, and poorer perception of own body, especially in young women [21, 31]. Our study, however, does not confirm these dependencies. In the studied group, there were no significant differences or decrease in sexual functioning and sexual satisfaction indicators in the compared groups of women according to age, type of surgery, indicators of the quality of life, body image, or side effects of treatment. This observation is consistent with the results of other authors [27]. The only statistically significant observation was that women after surgery within the right breast had significantly lower sexual functioning indicators than women after surgery within the left breast. This observation in the context of the information that probably most of the studied women were right-handed may indicate that the malfunction of the dominant hand after surgery translates not only into typically considered e.g., for the purpose of rehabilitation, areas of the patient functioning (work, self-service), but also into her intimate life. It is, however, difficult to generalize this conclusion due to the lack of the comparative group of left-handed women in the study.

Arndt et al. observed generally higher quality of life in young women undergoing surgery due to breast cancer. They noted, however, that older patients achieve better results in the subscales describing the physical, emotional, cognitive and social functioning than younger women [32]. Other researchers noted that older women anticipate the future perspectives (prognosis) better [33]. In contrast to the above observations, in our study there was no correlation between demographic variables, including age of the studied women, with the described functional components of the quality of life in the studied women. Other authors also postulate that the assessment of future perspectives is significantly better in the group of patients after breast conserving surgery compared to women after mastectomy [19]. Our study, however, did not confirm this relationship. Van Esch et al. examined the relationship between experiencing anxiety in the period following the surgery and the assessment of future prospects and the body image in women with breast cancer. They have found that higher anxiety levels positively correlated with a greater sense of hopelessness and worse body image, worse sexual functioning and with more side effects of treatment within the breast reported by women 6 and 12 months after surgery [34]. Graja et al., conducting research on the quality life in women treated for breast cancer showed that the negative appearance of the body causes the fear of breakdown of the family, and problems in intimate relationships with a partner [35]. Other authors also emphasize the negative impact of mastectomy on the emotional sphere [14]. The results

of our study are largely consistent with these observations. The multiple regression model showed that in the studied group there is a positive correlation between better emotional functioning (less mental stress, lack of tendency to worrying, no irritation, better mood) among women in the postoperative period and the assessment of both the body image and future perspectives. The better is the emotional functioning in a period of 3 months after the surgery, the better the perception of both the body image and the better assessment of future perspectives. The same multiple regression model, did not confirm, however, the relationship between emotional functioning and sexual functioning as well as sexual satisfaction in the studied group. We believe that the obtained data, as well as the results of other cited works, indicate the legitimacy of continued research on the quality of life in a group of patients undergoing surgery due to breast cancer. The point is that constantly changing methods and recommendations for cancer treatment should be followed by update of the psychological data necessary for effective impact on the improvement of emotional functioning, reducing anxiety and improving the overall health of the operated women [34].

Conclusions

1. The type of surgical technique does not affect the overall quality of life and sexual satisfaction of operated women. Therefore, these criteria should not be important to qualify a patient for a particular type of surgery.
2. The fact that the theoretically less burdensome procedure can be related to greater subjective experience of pain than a more extensive treatment should be taken into account in postoperative treatment.
3. Cognitive impairment (problems with memory and attention) reported by women after breast surgery does not correlate directly with the severity of systemic side effects of treatment and as such may require an independent diagnostics.
4. The assessment of the aesthetic of the scar is subjective and may positively correlate with better cognitive, emotional and social functioning, and better financial situation of women.
5. Problems in sexual functioning are observed in patients who underwent right-hand (dominant) side breast surgery. The need for sexology consultation should be considered in these women.
6. There is a risk of disturbances in the body image and in the assessment of future perspectives (prognosis) in patients with emotional disorders (higher levels of mental stress, worrying, irritability, depression) observed within 3 months after surgery. Therefore, active consultation approach and providing adequate psychological or psycho-oncological support seems to be reasonable.

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