

EVALUATION OF THE QUALITY OF LIFE OF WOMEN AFTER MASTECTOMY

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Abstract

Purpose

The most frequent cancer among women in Poland and worldwide is breast cancer. The aim of the study was to assess the quality of women's life after unilateral and bilateral breast amputation.

Research process

The study included 47 women – 24 women after bilateral amputation and 23 unilateral amputees. Two questionnaires were used: European Organization for Research and Treatment of Cancer - Quality of Life Questionnaire: general and breast cancer module to measure the quality of life of patients treated for cancer.

Results

From among the assessed areas of quality of life, the sphere of emotional functioning was significantly disturbed. The passage of time improved the quality of life of the surveyed women. Thanks to early detection and treatment survival time is extended, however the disease becomes a chronic disorder affecting the psychosomatic sphere that changes the quality of life of these women.

Key words: rehabilitation, mastectomy, breast cancer, quality of life, mental health, social function

Introduction

Breast cancer is the most common malignancy. It is the most common cause of death in women in Poland as well as in most other countries around the world. In Poland, about 12% of women suffer from a malignant form of cancer. In 2002, 1,150,000 new cases of breast cancer were diagnosed worldwide. After lung cancer, it was the second most diagnosed malignant tumor. The prognosis for breast cancer is generally good. The best results are achieved by the United States, where the 5-year survival among white women is 88.9%, among blacks 75.2% (the entire US population 87.7%). The International Agency for Research on Cancer estimates that around 12.7 million people have contracted and about 7.5 million people have died from cancer. In Europe, 1.7 million cases of cancer are diagnosed every year, of which 962 thousand are deaths. In Poland, the relative 5-year survival (1990–1999) according to the EUROCARE study amounted to 73.8% and was 13% worse than in other European countries (Burzyńska et al., 2020).

Studies on the quality of life of patients, especially in oncology, are becoming increasingly important. The USA National Cancer Institute and the European Organization for Cancer Research and Treatment (EORTC) have established appropriate research groups to assess the quality of life of patients. The quality of human life is an extremely subjective value and depends to a large extent on the personality traits, mental state, system of values and preferences. More and more cancerous diseases are shifting from the group of deadly to chronic diseases. Formerly, the emphasis was put on extending life; now quality of life is the priority. The concept of “quality of life” – quality of life (QL) – appeared after the Second World War. Initially, it meant a good life related to the state of having. Later, the definition of “to be, not only to have” was extended. New criteria have been introduced: freedom, education, health, and happiness. Health as a state of complete and good mental and social well-being, the lack of disease is not singularly the best reflection of quality of life, it includes physical fitness, physical condition, mental state, social situation, and somatic experience. In a society where breasts are an “attribute of femininity and motherhood” - subtracting them evokes a feeling of shame in front of a partner, family and environment, fear of returning to a normal life, and sometimes leads to family breakdown (Heydarnejad et al., 2011; Chopra & Kamal, 2012; Lavdaniti & Tsitsis, 2015; Nayak et al., 2017). “Half-woman complex” applies to many women after the treatment of breast cancer. Women feel defective, different than before surgery. Self-esteem changes, physical fitness reduces - there is a problem of quality of life after surgery. The “quality of life” can be understood as physical, psychological and social well-being (Neto et al., 2017).

Oncological rehabilitation covers the medical, motor, social, and professional spheres of activation in order to return to a normal family, professional and social life. It is carried out at the hospital and ambulatory stages, as well as spa stages. A very important element of rehabilitation is psychological rehabilitation, which has a positive impact on the patient's psyche. The goal is to gain acceptance of the new situation caused by the disease and its treatment. The task of psychological rehabilitation is also to convince a woman that it is possible to return to family, professional, and social life, restore self-confidence, conviction about the need for continuity of rehabilitation, establish contact with the patient and allow for “unloading of excessive emotions” (Bottomley, 2002; Abdollahzadeh et al., 2012). The quality of life of women after breast amputation causes a lot of physical and mental harm, lower self-esteem, and deterioration of the body's own image. Patients whose prognosis is inauspicious and have no chance of recovery are palliative. Palliative care is aimed at alleviating the patient's pain and improving the quality of life of the patient (Carlsson & Hamrin, 1994).

Research purpose

The aim of the study was to assess the quality of women's life after unilateral and bilateral breast amputation.

Research hypotheses

1. The type of breast amputation surgery affects the quality of life.
2. Double-sided amputation more often causes a negative feeling about the image of one's body than unilateral amputation.
3. The quality of life after mastectomy affects equally every area of quality of life.
4. The assessment of the quality of life depends on the time elapsed after the amputation.

Material of research

The study was carried out in two centers: at the Amazon Club in Wschowa (Klub Amazonek) and at the AQUAVIT Center for Treatment and Rehabilitation in Leszno. The study involved 47 women after radical treatment of breast cancer – 24 women after double-sided amputation and 23 women after unilateral amputation. The time after amputation ranges from 5 months to 17 years. The average age was 61.4 years. Over half of the surveyed women had secondary education, the least represented group was women with primary education (9%). 74% of women were retired, and 26% of women worked professionally.

Research method

The questionnaire of the EORTC research group was used to assess the quality of life: European Organization for Research and Treatment of Cancer (EORTC) Quality of Life Questionnaire (EORTC QLQ-C30 / general) and EORTC QLQ – Br 23 (breast cancer module). They contain information about well-being, physical and mental fitness as well as ailments related to illness and treatment. The QLQ questionnaire contains 30 questions that relate to:

1. General health (questions 29, 30).
2. Functioning: physical (questions 1, 2, 3, 4, 5), emotional (questions 21, 22, 23, 24), cognitive (questions 20, 25) and social (questions 6, 7, 26, 27).
3. General symptoms (questions 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19), nausea and vomiting (questions 14, 15), diarrhea, constipation (questions 16, 17), fatigue (questions 10, 12, 18), pains (questions 9, 19), dyspnea (question 8), insomnia (question 11), appetite (question 13).
4. Financial problems (question 28).

The QLQ-BR23 questionnaire contains 23 questions and is designed to assess the quality of life of women with breast cancer. Questions were grouped into two groups: concerning physical symptoms (31, 32, 33, 34, 37, 38, 47, 49, 50, 51, 52) and psychological symptoms (35, 36, 39, 40, 41, 42, 43, 44, 45, 46, 48, 53). Patients were to choose one of four answers (4-point scale) 1 – never, 2 – sometimes, 3 – often, 4 – very often. Questions on the overall assessment of quality of life and health are presented on a scale of 1–7 (1 – very poor health and quality of life, 7 – excellent health and quality of life). For each question, the patient chose one answer. The women who took part in the survey were informed about the voluntary participation in the survey. They replied anonymously to the questionnaires.

Application of statistical analysis

The frequency of quality of life elements included in individual questions of C30 and BR23 questionnaires were evaluated on a point scale of 1 to 4 points (from “never” to “very often”). Groups of questions referred to as scales (or subscales) of quality of life were subject to analysis. The frequency rating corresponding to the group of questions was determined as the sum of the person's answer to individual questions divided by the number of questions (is the average value within a given scale / subscale). The average values were determined by calculating the arithmetic means. Dependence on the type of amputation (bilateral vs unilateral or left-sided vs. right-sided) was assessed using t-Student's test for independent trials. With the truth of the null hypothesis about the lack of dependence on the side of the operation, the test function t-Student distribution with $N_1 + N_2 - 2$ degrees of freedom (N_1 and N_2 denote the size of both groups). The t-Student's test for dependent tests (difference test) was used to compare the role of physical and mental symptoms (on the BR23 scale). With the truth of the null hypothesis with the same influence of physical and mental symptoms on the quality of life, the test function t has a t-Student distribution with $N - 1$ degrees of freedom. The correlation of quality of life assessments with the time elapsed from amputation was assessed using the ρ -Spearman order correlation coefficient. Verifications of null hypotheses were carried out at the critical level of significance $\alpha = 0.05$. This means that statistical significance was adjudicated when the probability of p test met the inequality: $p < 0.05$. All calculations were performed using the STATISTICA 10 statistical package from StatSoft (Shapiro & Wilk, 1965).

Results

Analysis of the research group

The study involved 47 women after mastectomy. The age of the respondents ranged from 49 to 79 years, with an average age of 61.4 and a standard deviation of 5.6 years. The most numerous group was women with secondary education ($n = 25.53\%$), and the least numerous group of women were those with a primary education ($n = 4.9\%$), (74%) of women were retired, and (26%) women were professionally active. 24 people (51% of the research group) were after bilateral amputation. In the case of unilateral amputations, the number of left-sided amputations was 26% ($n = 12$) and right-sided (23%) ($n = 11$). In turn, the time elapsed since amputation was very diverse and ranged from 0.5 years to 17 years (Table 1).

Table 1. Distribution of time elapsed since amputation

Time from amputation	n	%
up to 3 years	10	21%
from 3 to 5 years	12	26%
from 5 to 10 years	16	34%
over 10 years	9	19%

Among the treatment methods for the examined women, the most common was radiotherapy and the rarest hormone therapy. In addition, medications were often given. During radiotherapy, 45% ($n = 21$) of women received pharmacotherapy and 30% of women ($n = 14$) received chemotherapy. The most common forms of rehabilitation were lymphatic massage, gymnastics (96%), kinesiology taping, bandaging, and pneumatic massage.

*Evaluation of the quality of life of women after mastectomy***Analysis of the EORTC QLQ-C30 questionnaire**

Question 30 of this questionnaire concerned a subjective assessment of the current quality of life assessed on a scale of 1 to 7 points. The number of points 6–7 meant good quality of life, 4–5 points - average, and 1-3 points - bad. The average of the answers for the whole research group was 4.66 points, which corresponds to the average quality of life (64%, $n = 30$). Indeed, the answers within 4–5 points were the highest. At the same time, only 6 women (13%) rated their quality of life as bad.

There was no significant correlation between the assessment of current quality of life and the type of surgery. The average score in the group of women after bilateral amputation was 4.71 points, and the unilateral amputation was 4.61 points. Admittedly, women with unilateral amputation rated the quality of their lives as poor in a larger percentage, but this result should be considered accidental in the absence of statistical significance of dependence on the type of surgery ($p = 0.67 > 0.05$). Women with left-side amputations in a larger percentage assessed their quality of life as good compared to women after right-side amputation, where the opposite situation was observed. The dependence of the assessment of the quality of life on the side of amputation with unilateral amputations suggests that the right-hand amputation was more painful for the examined women. However, this requires confirmation on more research material (the test probability in the chi-square test is $p = 0.088$) (Table 2).

Table 2. Assessment of quality of life depending on the aspect of amputation

Quality of life	Amputation				Amputation			
	bilateral		unilateral		bilateral		unilateral	
	n	%	n	%	n	%	n	%
bad	2	8%	4	17%	1	8%	3	27%
average	16	67%	14	61%	8	67%	6	55%
good	6	25%	5	22%	3	25%	2	18%

The subjective assessment of the current quality of life (question 30 of the QLQ-C30 questionnaire) strongly correlates with the subjective assessment of the current state of health (question 29 of the QLQ-C30 questionnaire). The ρ -Spearman rank correlation coefficient of these two ratings is $\rho = 0.796$ and is highly statistically significant ($p < 0.00001$). With the same categorization of health assessment as in the case of the quality of life assessment, we conclude that the vast majority of women assessed their current state of health as average (79%, $n = 37$). On the other hand, the fewest number of people assessed their health condition as good (8%, $n = 4$). And those that assessed their health condition as bad were represented by 13% of respondents ($n = 6$).

The 27 questions of the QLQ-C30 Questionnaire (excluding the 29 and 30 questions discussed above and questions 28 related to financial problems) were grouped into five areas of quality of life (Table 3).

Table 3. Question number in the QLQ-C30 Questionnaire, and the quality of life area

Area of quality of life	Question number in the Questionnaire QLQ-C30
Physical functioning	1, 2, 3, 4, 5
Emotional functioning	21, 22, 23, 24
Social functioning	6, 7, 26, 27
Cognitive functioning	20, 25
Ailments (symptoms)	8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19

Each of the above-mentioned questions is associated with a specific problem whose occurrence lowers the quality of life. Emotional problems turned out to be the most common (in 31% of respondents they were frequent or very common). Problems with physical functioning and ailments lowering the quality of life were similar with frequency (physical problems often or very often occurred in 21% of respondents, and various ailments in 20% of respondents). The incidence of problems decreasing the quality of life in separate areas is illustrated in Figure 1. Questions QLQ-C30 questionnaire regarding physical, emotional, social and cognitive functioning (a total of 25 questions) together create the so-called functional scale, questions about ailments (12 questions) form the so-called scale of symptoms. Comparing the mean (in points) with the answers to the questions within these two scales - we come to the conclusion that various ailments (pain, fatigue, dyspnea, insomnia, gastric problems) significantly lower the quality of life of women after mastectomy more so than do limitations on the functional scale. The degree of reduction in the quality of life described in the functional scale did not differ significantly in the group of women after bilateral and unilateral amputation. Similarly, bilateral or unilateral amputation did not have a significant impact on the quality of life reduction due to the complaints (Table 4).

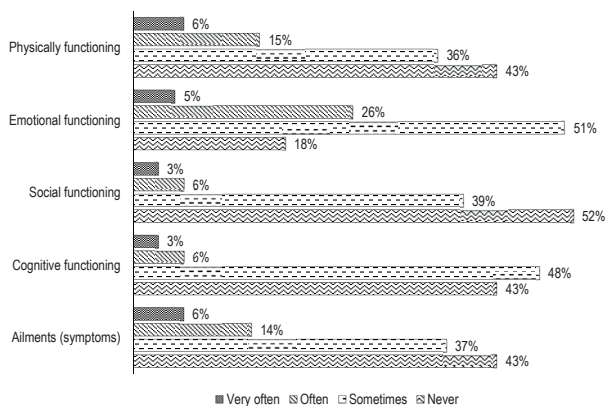
**Figure 1.** Frequency of problems lowering the quality of life in separate areas

Table 4. The dependence of the average degree of reduction in the quality of life (in points) on the functional scale and the scale of symptoms from the type of amputation

Scale	Amputation				Student's test	
	bilateral		unilateral		t	p
	Average [point.]	St. dev. [point.]	Average [point.]	St. dev. [point.]		
functional	1.09	0.18	1.14	0.37	0.69	0.50
symptoms	1.76	0.33	1.89	0.67	0.85	0.40

Analysis of the EORTC QLQ-BR23 questionnaire

The questions in this questionnaire refer to the symptoms understood more broadly than the scale of symptoms in the QLQ-C30 questionnaire, which in principle included only various ailments. Questions of the QLQ-BR23 questionnaire were considered in grouping into two groups of symptoms of life:

1. Physical symptoms – questions: 31, 32, 33, 34, 37, 38, 47, 48, 49, 50, 51, 52.
2. Psychic symptoms – questions: 35, 36, 39, 40, 41, 42, 43, 44, 45, 46, 53.

In both groups of symptoms the number of questions is similar (in the group of physical symptoms – 12 questions, in the group of psychological symptoms – 11 questions).

Regardless of this general division, two sub-groups of questions were considered:

- body image - questions: 39, 40, 41, 42.
- sexual functioning - questions: 44, 45, 46.

As in the case of the QLQ-C30 questionnaire, within each group or sub-group the response score was summed up and the average value was calculated (taking into account the number of questions). It should be noted, however, that the score on the three questions related to sexuality is reversed (the more points, the less the quality of life). Physical symptoms significantly more often reduced the quality of life of women after mastectomy than psychological symptoms. The frequency of cases lowering the quality of life through physical and mental symptoms did not depend on the nature of the procedure. Physical symptoms occurred on average with a similar frequency in the group of women after bilateral and unilateral amputation. A similar lack of dependence on the nature of amputation was found in the frequency of psychological symptoms (Table 5). What's more, half of the women surveyed had no problems (negative feelings) associated with the image of their own body, and 39% had such problems sporadically. Interestingly, unilateral amputation more often causes negative feelings about the body image than bilateral amputation. The difference in the average frequency of such feelings (in point) cannot be considered statistically significant ($t = 0.77$, $p = 0.45 > 0.05$). Confirmation of the possible dependence of the frequency of negative feelings about the image of the body on the nature of amputation requires confirmation on a larger research scale. No relationship was found in the analyzed material.

Table 5. The frequency of physical and mental symptoms (in points) depending on the type of amputation

Symptoms	Amputation				Student's test	
	bilateral		unilateral		t	p
	Average [point.]	Std. Dev. [point.]	Average [point.]	Std. Dev. [point.]		
physical	1.87	0.36	1.91	0.60	0.26	0.79
mental	1.69	0.37	1.65	0.49	0.36	0.72

Sexual activity of women after mastectomy is relatively small. 34% of surveyed women do not partake in such activity, and almost half (48%) only sporadically. Sexuality of women after bilateral amputation in the study group was relatively greater than the sexual activity of women after unilateral amputation. However, the observed difference in their average activity levels (in points) is not statistically significant ($t = 1.39$, $p = 0.17 > 0.05$).

Dependence of the quality of life assessment from the time that elapsed from amputation

The correlation coefficients of the ρ -Spearman order of rankings between the quality of life expressed in the points and the time elapsed since the breast amputation surgery have a negative sign in all considered scales. This means that the longer the time after amputation, the lower the subjective impression of lowering the quality of life. They experience the most severe decline in quality of life shortly after surgery. The passage of time usually improves their assessment of quality of life. However, it should be emphasized that the correlations observed are rather weak and cannot be considered statistically significant ($p > 0.05$). Undoubtedly, the analysis of the correlation of the quality of life assessment with the time after surgery requires the inclusion of a larger number of cases. The strongest correlations were observed regarding the quality of life described in the functional scale and the scale of physical symptoms. Physical limitations and physical symptoms have the strongest influence on changes in the quality of life experienced as time goes on. The functional scale in the QLQ-C30 questionnaire was analyzed using 5 subscales. Spearman's correlation coefficients of quality of life assessment with time elapsed after surgery is also negative. The assessment of quality of life within the sphere of emotional functioning changes most strongly with time. Elapsed time reduces the negative impact of emotional feelings decreasing the quality of life of women after mastectomy. Social and cognitive functioning practically do not change depending on the time elapsed after surgery.

Discussion

The research into the quality of life of patients after a radical mastectomy proved that the disease and its treatment deteriorated the quality of life in all areas of life. Questionnaires (CORE) for measuring the quality of life of patients treated for cancer QLQ – C30 and QLQ 0 BR 23 allowed to assess the disorders in the emotional, physical, social sphere, assessment of the image of oneself and somatic disorders (May et al., 2014). The changes in the quality of life as a result of breast cancer were confirmed by many researchers. Ringdal et al. (1994) stated that patients with a good prognosis experienced higher quality of life than patients with medium or poor prognosis. They emphasized that the factor determining the emotional state after breast amputation was the presence of lymphatic edema. Therefore, Devoogdt et al. (2010), Zimmermann et al. (2012) and Moseley et al. (2007) stated that in the rehabilitation procedure other forms of therapy should be taken into account, such as lymphatic

drainage or compression pneumatic. These treatments resulted in the reduction of edema, prevented contractures of the muscles and significantly reduced pain. Many researchers, including Courtney et al. (2007), Douglas (2005), Kampshoff et al. (2010), Spence et al. (2010), emphasized the importance of the physical sphere in the process of progressive cancer. They stated that this sphere had a significant impact on the well-being of women after the illness. Therefore, in this study, the influence of physical rehabilitation on the general condition and improvement of women's well-being was also analyzed. It turned out that the exercises during treatment of the oncological disease can help reduce the feeling of fatigue; A similar result of the study was shown by Velthuis et al. (2010). The study included 150 patients with breast cancer and 150 patients with colorectal cancer. Participants were randomly assigned to test and control groups. The study group additionally participated in the 18-week supervised exercise program, while the control remained with the current physical activity. People in the study group showed a significant decrease in fatigue in the questionnaires. It is worth noting that the team of fatigue and cancer weakness is one of the most frequently reported symptoms and a significant problem for almost all patients. According to the research results - half of the women did not have negative feelings associated with the image of their own body. However, their sexual activity was reduced. Our research has shown that the passage of time significantly reduced their negative emotional feelings. The reduction in the quality of a woman's life shortly after the surgery was the strongest. Cordova et al. (2019) confirmed the improvement of quality of life over time. Type of surgery - unilateral or bilateral mastectomy did not show a significant relationship affecting the comfort of a woman's life. In their own research, social and cognitive functioning reduced their quality of life the least. Social contacts were still maintained, very often at Amazon clubs. They received a lot of support from their relatives, so women did not feel rejected. A very important place in the life of Amazons is rehabilitation. In our research, it was found that women taking part in social events were in a much better physical and emotional condition. Psychological help and the ability to deal with stress on a daily basis are important. There are many examples in the literature that support this statement.

Results

From among the assessed areas of quality of life, the sphere of emotional functioning was significantly disturbed. Social functioning was rated best. The standard of life reduced most drastically shortly after surgery. The passage of time improved the quality of life of the surveyed women.

Conclusions

Thanks to early detection and treatment survival time is extended, however the disease becomes a chronic disorder affecting the psychosomatic sphere that changes the quality of life of these women. The risk of malignant tumors increases with age.

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