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## QUALITY OF LIFE IN PATIENTS WITH BREAST CANCER AND LYMPHEDEMA IN CANTON SARAJEVO, BOSNIA AND HERZEGOVINA

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**Abstract:** One of the most prevalent side effects following breast cancer therapy is lymphedema.. The literature lists various symptoms experienced by patients with lymphedema, such as a feeling of heaviness and tightness in the arm, numbness, weakness, and pain. Less physical activity does not only result in a lower quality of life; it also has an adverse effect on the psychosocial component of life. The purpose of this study was to compare the levels of respondents with breast cancer who had lymphedema and those who did not, as well as to look into the respondents' quality of life.

**Material and Methods:** The research was conducted in the Association of persons suffering from and treated for breast cancer "Renesansa" in Sarajevo. 35 respondents were included in the study. The instrument used in our study was the standardized FACT -B+4 questionnaire. The research was conducted in the period from the end of March to the beginning of May 2022.

**Results:** Of the total number of respondents with breast cancer, the proportion of respondents with breast cancer and lymphedema was 17.1%. The quality of life of respondents with breast cancer and lymphedema was lower in terms of physical health and emotional and functional status.

**Conclusion:** The quality of life of respondents with breast cancer and lymphedema differed from the quality of life of respondents with breast cancer without lymphedema. The level of quality of life of respondents with breast cancer and lymphedema is slightly lower than the level of quality of life of respondents with breast cancer without lymphedema, but without statistically significant difference.

**Keywords:** Quality of Life; FACT -B 4; Surveys and Questionnaires; Pain; Exercise

### 1. INTRODUCTION

A significant public health issue is breast cancer. Despite current attempts to prevent the disease, the incidence is rising in the majority of nations and is predicted to do so during the next 20 years. (Howell A., 2014). The leading cancers in the Federation of Bosnia and Herzegovina in 2018 by location localization, are breast cancer (23.4%), followed by cancer of the respiratory tract (7.4%) and uterine cancer (7.0%) among all newly diagnosed neoplasms in women (ZZJZFBiH, 2020). Statistical data show that breast cancer accounts for about 25% of all malignancies in

women, which is almost twice as much as all gynecologic cancers combined (Ostrogonac K., 2016). Because breast cancer is a chronic rather than a life-threatening disease, thanks to advances in early diagnosis and more effective treatment, health professionals must recognize and manage the long-term consequences of therapeutic modalities (Bojinović Rodić D., 2016). Breast cancer therapy involves a multidisciplinary approach consisting of surgery, radiation therapy, neoadjuvant therapy, and adjuvant therapy (Fisusi F.A., 2017).

Lymphedema is one of the most common complications after breast cancer treatment (Bojinović Rodić D., 2016), affecting approximately 15% to 30% of patients after surgery (Liang M., 2020).

Lymphedema is a chronic, progressive condition in which edema of a specific body part develops, i.e., an accumulation of intercellular fluid due to an impaired balance between the transport capacity of lymphatic vessels and the amount of capillary filtration (Špoljar S., 2015).

Several authors have investigated lymphedema and its effects on physical and mental health as well as quality of life in an effort to find precise estimates of incidence and prevalence. According to research, depending on the degree of axillary dissection and the use of radiation, the total incidence of arm lymphedema within 3 years of surgery might range from 8% to 56%. (Oliveri J.M., 2008).

To reduce the incidence of lymphedema, the National Lymphedema Network has recommended preventive measures. These include avoiding air travel, protecting the hand from injury or skin infection, avoiding high temperatures on the hand, and taking blood samples or blood pressure measurements (He L., 2020). Therapy for lymphedema can be conservative or surgical. The basic therapy is the implementation of combined physical therapy with the use of compression therapy (Špoljar S., 2015). Lymphedema can develop at any time after treatment, but most patients develop it within the first two to three years after treatment (Bodai B., 2015). Breast cancer patients' evaluations of their own physical, mental, and social health as influenced by diagnosis, treatment, follow-up, and survival are referred to as health-related quality of life. It is evaluated using reliable tools. (Pusic A., 2013). Research on cancer-related lymphedema is important because lymphedema has a strong impact on physical, mental, and social health and directly affects quality of life. Lymphedema is more problematic for breast cancer survivors than mastectomy in terms of overall health. (Kalemikerakis I., 2021). Studies have shown that changes in arm volume do not affect quality of life as much as pain caused by lymphedema. Pain can interfere with performing activities of daily living and achieving desired goals and can lead to feelings of despair and depression, which decreases quality of life (Teo I., 2015). The aim of our study is to evaluate the quality of life experienced by patients with breast cancer with lymphedema to that experienced by individuals with breast cancer without lymphedema.

## 2. METHODS

The study was designed as a descriptive, analytical and comparative cross-sectional study. The study was conducted between the end of March and the beginning of May 2022.

The sample consists of 35 members of the Association of persons suffering from and treated for breast cancer "Renesansa" in Sarajevo, of different ages, suffering from breast cancer with or without developed lymphedema, regardless of whether they are currently undergoing or have completed breast cancer therapy (chemotherapy, radiotherapy, hormone therapy)

The instruments used for the study were:

- The sociodemographic data questionnaire included questions on age, marital status, number of family members, occupation, employment, date of diagnosis of breast cancer and lymphedema (if any), whether the patient is currently undergoing a therapeutic process, and whether she has undergone or is currently undergoing physical therapy and rehabilitation.

- For patients with lymphedema and breast cancer, the standardized questionnaire FACT-B+4 measures quality of life. It is divided into five sections that look at five areas of patients' quality of life: physical health, social relationships, emotional state, functional state, and supplementary questions about various challenges faced by patients with breast cancer and lymphedema. (Andrade Ortega J.A., 2017).

Criteria for inclusion and exclusion from the study

The criteria for inclusion in the study included respondents diagnosed with breast cancer without lymphedema who had surgery on the axillary lymph nodes and respondents diagnosed with breast cancer and lymphedema who had surgery on the axillary lymph nodes. Respondents diagnosed with breast cancer who did not undergo surgery on the axillary lymph nodes were excluded from the study.

The study was approved by the Ethics Committee of the College of Sarajevo - Faculty of Health Studies, approval number 04-7-10-5/22 (02-3-614/11). The study was conducted solely on a voluntary basis and each respondent gave informed consent to participate in the study. The identity of the respondents will be protected in accordance with ethical and privacy principles.

Results of the analysis are presented tabularly and graphically as absolute number of cases, percentage, arithmetic mean with standard deviation, standard error of the arithmetic mean, and range of values. Appropriate parametric or non-parametric tests were used based on the distribution test by Shapiro-Wilk test. The chi-square test, Fisher's exact test, Student's t-test, and Mann-Whitney test were used to test the differences between the observed groups. Spearman's correlation coefficient was used to test the influence of individual independent variables on the results. The results of all the above tests were considered statistically significant at the 95% confidence level or at values of  $p < 0.05$ . Analysis was performed using the statistical package IBM Statistics SPSS v 23.0.

### 3. RESULTS

35 respondents were included in the study, of which 82.9% were breast cancer patients without lymphedema and 17.1% were breast cancer patients with lymphedema (Graph 1).

The analysis of the average time of diagnosis of lymphedema in the respondents with breast cancer shows that this period was, on average,  $5.67 \pm 4.18$  years (Table 1).

The analysis of the average score on the physical health subscale (max = 28) showed that the average score in the total sample was  $19.97 \pm 6.66$  (interval 7-28), and that it was slightly lower in the respondents with breast cancer and lymphedema,  $18.67 \pm 7.26$  (interval 8-27) in relation to the average score in the respondents with breast cancer without lymphedema,  $20.24 \pm 6.64$  (interval 7-28), but without a statistically significant difference ( $Z = -0.527$ ;  $p = 0.623$ ;  $p > 0.05$ ) (Graph 2).

The analysis of the average score on the social-family relations subscale (max = 28) showed that the average score in the total sample was  $21.78 \pm 5.11$  (interval 10-28), and that it was slightly higher in the respondents with breast cancer and lymphedema,  $23.53 \pm 4.75$  (interval 15.17-28), in relation to the average score in the respondents with breast cancer without lymphedema,  $21.42 \pm 5.18$  (interval 10-28), but without a statistically significant difference ( $Z = -1.010$ ;  $p = 0.334$ ;  $p > 0.05$ ) (Graph 3).

The analysis of the average score on the emotional state subscale (max = 24) shows that the average score in the total sample was  $19.14 \pm 4.61$  (interval 5-24), and that it was slightly lower in the respondents with breast cancer and lymphedema,  $16.67 \pm 6.22$  (interval 5-22), in relation to the average score in the respondents with breast cancer without lymphedema,  $19.66 \pm 4.16$  (interval 5-24), but without a statistically significant difference ( $Z = -1.256$ ;  $p = 0.218$ ;  $p > 0.05$ ) (Graph 4).

The analysis of the average score on the functional state subscale (max = 28) showed that the average score in the total sample was  $21.86 \pm 4.34$  (interval 14-28), and that it was slightly lower in the respondents with breast cancer and lymphedema,  $19.50 \pm 5.24$  (interval 15-28), in relation to the average score in subjects with breast cancer without lymphedema,  $22.34 \pm 4.06$  (interval 14-28), but without a statistically significant difference ( $Z = -1.451$ ;  $p = 0.159$ ;  $p > 0.05$ ) (Graph 5).

The analysis of the average score of the functional ability of the hand (max = 20) showed that the average score in the total sample was  $13.77 \pm 5.36$  (interval 2-20), and that it was slightly lower in subjects with breast cancer and lymphedema,  $10.67 \pm 6.02$  (interval 2-19), in relation to the average score in the respondents with breast cancer without lymphedema,  $14.41 \pm 5.10$  (interval 4-20), but without a statistically significant difference ( $Z = -1.451$ ;  $p = 0.159$ ;  $p > 0.05$ ) (Graph 6).

The analysis of the average score on the scale of the total score of the quality of life (max = 148) showed that the average score in the total sample was  $107.07 \pm 19.27$  (interval 61.5-136), and that it was slightly lower in the respondents with breast cancer and lymphedema,  $98.69 \pm 24.23$  (range 61.5-131), compared to the average score in the respondents with breast cancer without lymphedema,  $108.8 \pm 18.11$  (range 74.-136) but without statistically significant differences ( $Z = -0.985$ ;  $p = 0.334$ ;  $p > 0.05$ ) (Graph 7).

### 4. DISCUSSION

Studies on the occurrence of lymphedema associated with breast cancer have shown that it has a strong impact on physical, psychological, and social health and directly affects quality of life (Kalemikerakis I., 2021).

Decreased quality of life is not only the result of limited physical activities, but also has detrimental effects on the psychosocial domain of life (Bojinović Rodić D., 2016).

The Bojinović-Rodić study showed a connection between lymphedema and breast cancer. The data indicate that 46 participants (45.1%) and 56 subjects (54.9%), respectively, did not previously receive therapy for breast cancer-related lymphedema. The existence of prior treatments did not differ between the observed groups in a way that was statistically significant ( $\chi^2 = 1.425$ ,  $p = 0.233$ ) (Bojinović Rodić D., 2016).

The research by Jørgensen and associates showed that patients with breast cancer and lymphedema had significantly lower quality of life on 16 of the possible 18 subscales of the health-related quality of life questionnaire, and some of the subscales were: physical functioning (MDs 27, 95%CI: 24; 30), mental health (MDs 24, 95%CI: 21; 27), and

social functioning (MDs 20, 95%CI: 17; 23) (Jørgensen M G., 2021). The findings of Jørgensen and colleagues correlate with our results.

In a study by Tao and colleagues, it was discovered that depressive symptoms were positively correlated with perceptions about the severity of pain and the integrity of the body. It is possible that higher levels of pain caused higher levels of body image dissatisfaction, which in turn caused stronger symptoms of depression. Body image dissatisfaction is thought to mediate the relationship between pain and depressive symptoms. Moreover, body image issues served as a mediating factor in the connection between body integrity beliefs and depressive symptoms, showing that more strongly held body integrity views were associated with greater body dissatisfaction and more severe depressive symptoms. (Tao I., 2015). Tao and colleagues' research correlates with our findings when it comes to the emotional health of respondents with breast cancer and lymphedema.

Zhang and colleagues' study, titled "Predictors of quality of life in patients with lymphedema associated with breast cancer: age, stage of lymphedema, and anxiety," gathered pretreatment data on patients' sociodemographic (height, weight, age, education level, employment status, marital status, and economic status) and clinical (surgery method, clinical stage of cancer, severity of lymphedema, and duration of treatment) characteristics. The first step was to do a univariate analysis or bivariate correlation to investigate the relationship between quality of life and sociodemographic/clinical traits, anxiety, and depression. To find independent predictors of quality of life, a multiple linear regression model was applied. The study included 71 participants who had lymphedema related to breast cancer. Age, education level, occupational status, family income, duration of lymphedema, severity of lymphedema, and scores on the anxiety and depression scales were significantly related to quality of life ( $p < 0.05$ ) (Zhang L., 2021).

The authors of the aforementioned study concluded that age, lymphedema severity, and anxiety scores were the most important predictors of quality of life. Therefore, it is very important to establish a lymphedema prevention system and pay attention to the psychological distress of patients with lymphedema. The results of the mentioned research are consistent with our findings.

In the study entitled "Secondary arm lymphedema, illness perception, self-efficacy, and depression as determinants of quality of life in patients with breast cancer" by Popović-Petrović and co-workers, no significant difference was found between groups in the total quality of life score ( $t = 0.469$ ,  $p > 0.05$ ) nor in the individual domains: physical well-being ( $t = 0.535$ ,  $p > 0.05$ ), social/family well-being ( $t = 1.43$ ,  $p > 0.05$ ), emotional well-being ( $t = 1.35$ ,  $p > 0.05$ ), functional well-being ( $z = -0.243$ ,  $p > 0.05$ ), symptoms caused by breast cancer ( $t = -0.839$ ,  $p > 0.05$ ), and hand discomfort ( $t = -0.514$ ,  $p > 0.05$ ), while illness perception ( $\beta = -0.603$ ,  $t = -5.958$ ,  $p < 0.001$ ) and depression ( $\beta = -0.411$ ,  $t = -4.101$ ,  $p < 0.001$ ) were shown to be significant predictors of quality of life and explain 50.2% of the variance of the total quality of life (Popović-Petrović S., 2018).

The findings of Popović-Petrović and associates are in correlation with our results, in which no statistically significant difference was found in the overall assessment of quality of life between patients with breast cancer with and without lymphedema.

The study titled "Upper Extremity Function and Quality of Life of Persons with Lymphedema Associated with Breast Cancer" demonstrated in the results a higher value of the composite score of the SF -36 questionnaire for mental health ( $47.0 \pm 12.2$ ) than for physical health ( $42.2 \pm 7.5$ ). The highest scores for individual quality of life were found for the domains of mental health ( $67.7 \pm 22.9$ ) and social functioning ( $70.1 \pm 23.1$ ). The lowest values were registered for the domains of disability due to physical health ( $46.9 \pm 39.1$ ) and general health ( $49.3 \pm 20.1$ ). Upper extremity function was statistically significantly correlated with the domains of disability due to physical health, pain, and physical composite score, and with the domain of disability due to emotional state ( $p < 0.01$ ) (Bojinović Rodić D., 2016).

The results of the aforementioned study do not correlate with our results in the physical health and emotional state domains, as the respondents in our study had a higher score on the physical health subscale ( $18.67 \pm 7.26$ ) compared to the emotional state subscale ( $16.67 \pm 6.22$ ), while the results related to hand function correlate with the results of our study. Analysis of the mean score of hand functioning in our study showed that the mean score in the total sample was  $13.77 \pm 5.36$  (interval 2-20) and that it was slightly lower in respondents with breast cancer and lymphedema ( $10.67 \pm 6.02$ ) compared with subjects with breast cancer without lymphedema ( $14.41 \pm 5.10$ ).

The study by author Lopez Penh and colleagues entitled "Quality of life of patients with lymphedema associated with breast cancer and reconstructive breast surgery" showed a significant impact of lymphedema on physical function ( $\beta = -7.46$ ;  $p = 0.009$ ), social roles ( $\beta = -15.75$ ;  $p = 0.003$ ), cognitive functions ( $\beta = -11.56$ ;  $p = 0.005$ ), body image ( $\beta = -11.62$ ;  $p = 0.007$ ), hand symptoms ( $\beta = 20.78$ ;  $p = 0.000$ ) and all domains of the Lymph-ICF (Lymphoedema Functioning, Disability and Health Questionnaire) questionnaire (Lopez Penha D.R., 2016). This study implies that lymphedema has negative effect on the quality of life of breast cancer survivors, and its results correlate with our results.

## 5. CONCLUSION

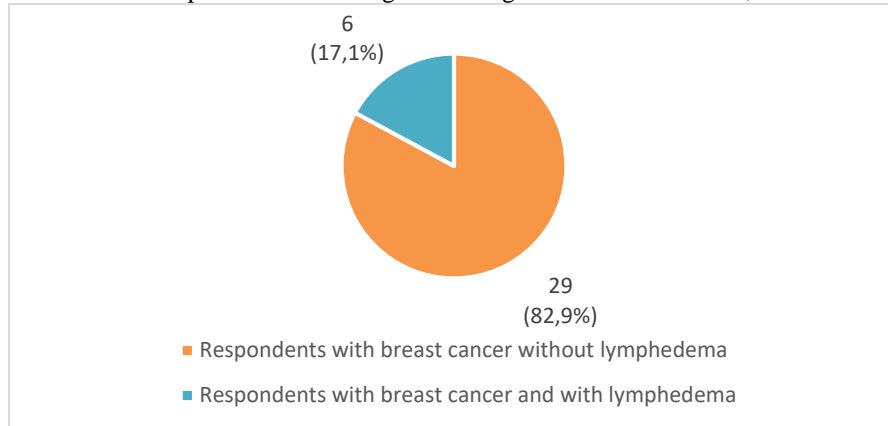
Based on our research results and according to the set goals, we concluded that the quality of life of patients with breast cancer and lymphedema is somewhat lower compared to the quality of life of patients with breast cancer without lymphedema, especially in the areas of physical health and emotional and functional state. It is necessary to work on patient education about lymphedema and its prevention to maintain quality of life at a satisfactory level.

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Tables and graphs

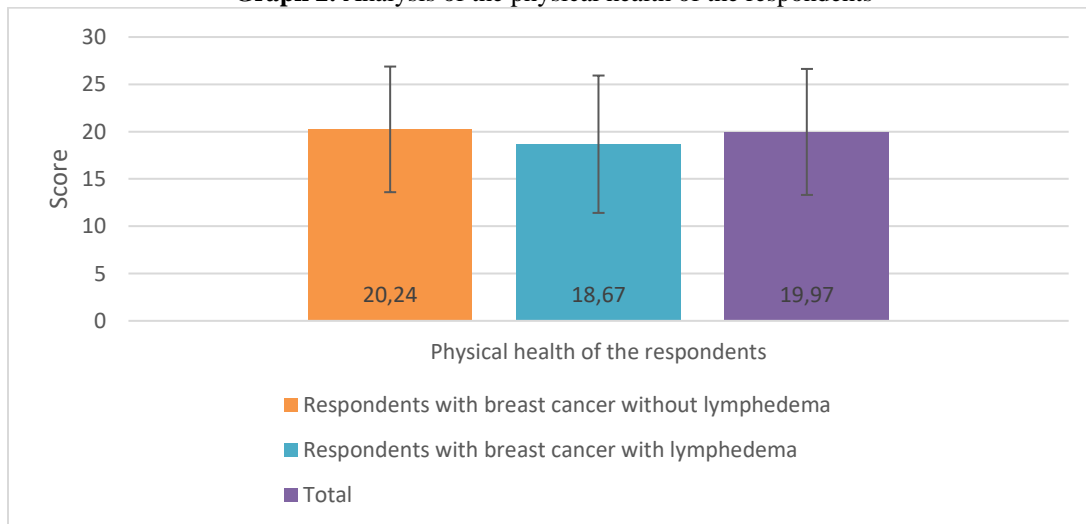
**Graph 1.** Presentation of the respondents according to the diagnosis of breast cancer, with or without lymphedema



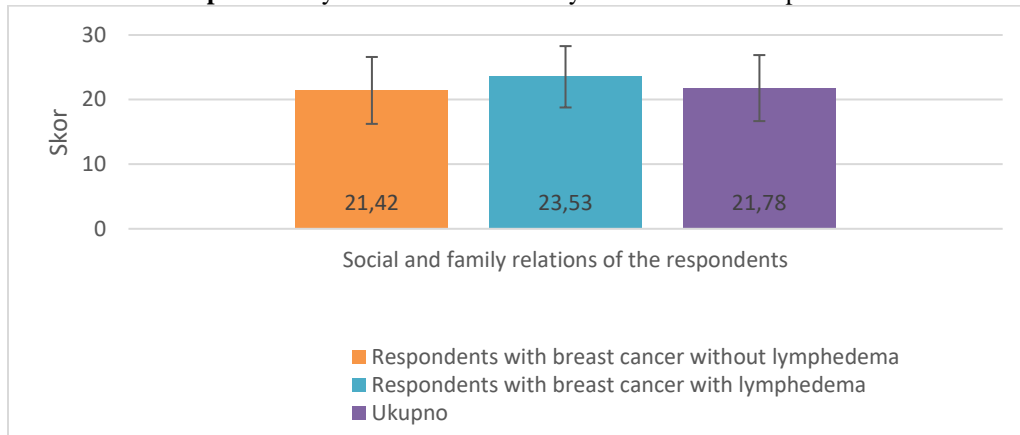
**Table 1.** Analysis of the average period of diagnosis of lymphedema in the respondents with breast cancer

	N	X	SD	SEM	Minimum	Maximum
Lymphedema period	6	5,67	4,18	1,71	1,00	12,00

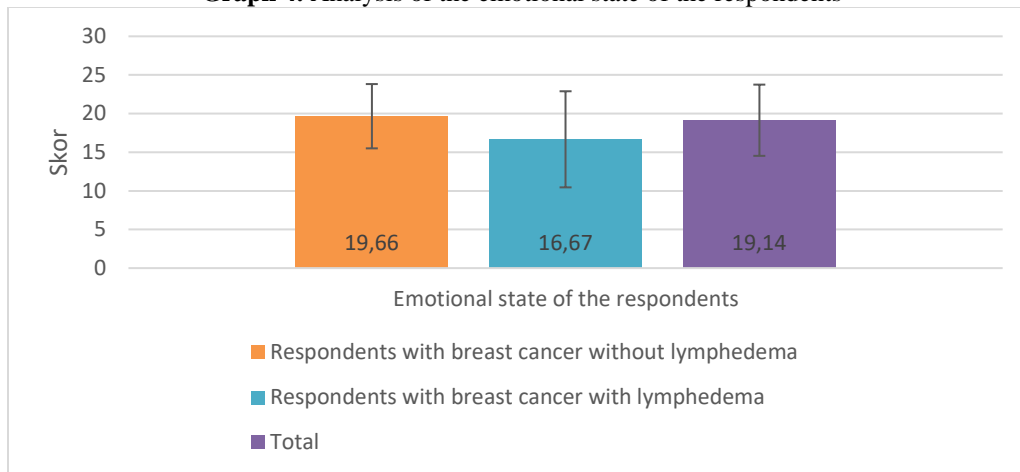
**Graph 2.** Analysis of the physical health of the respondents



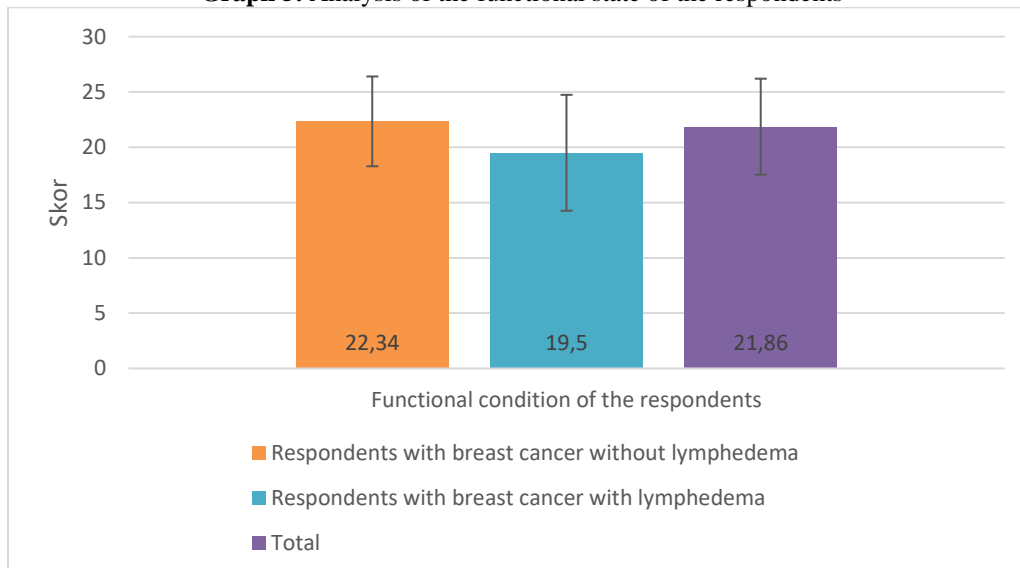
**Graph 3.** Analysis of social and family relations of the respondents



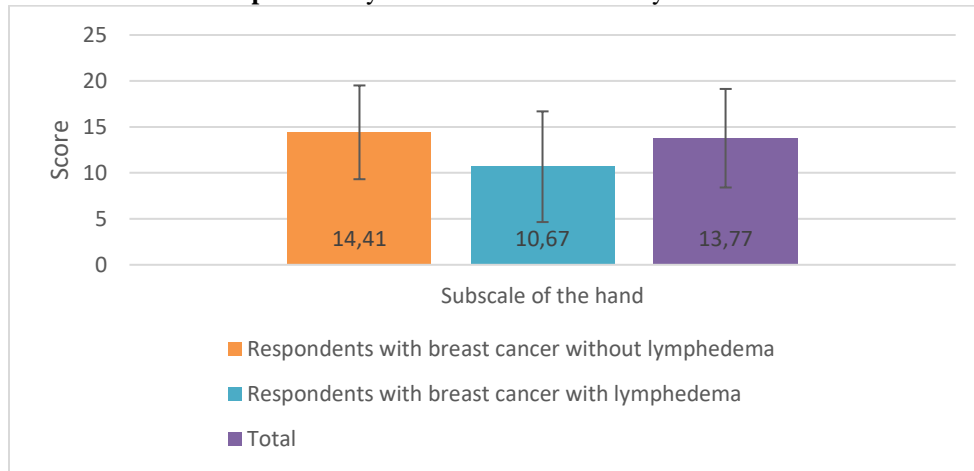
**Graph 4.** Analysis of the emotional state of the respondents



**Graph 5.** Analysis of the functional state of the respondents



**Graph 6.** Analysis of the functional ability of the hand



**Graph 7.** Analysis of the total quality of life score

