

Quality of life in women with breast cancer, 6 months after mastectomy

Maria Karaoglou¹, Georgios Athanasas², Nikolaos Danias³,
Eleni Kyritsi⁴, Dimitrios Papageorgiou⁵, Niki Pavlatou⁶,
Maria Polikandrioti⁷

Ποιότητα ζωής γυναικών με
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τη μαστεκτομή

Abstract at the end of the article

¹Nurse, Mrs, PhD candidate. 1st Health
Center of Elefsina

²Associate Professor, School of
Medicine, EKPA

³Associate Professor, School of
Medicine, EKPA

⁴Professor, Department of Nursing,
University of West Attica

⁵Assistant Professor, Department of
Nursing, University of Peloponnese

⁶Assistant Professor, Department of
Nursing, University of West Attica

⁷Professor, Department of Nursing,
University of West Attica

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Corresponding author:

Karaoglou Maria, Elefteriou Venizelou 112B,
TK 19200 Eleusis, e-mail:karaogloumary@
gmail.com

Introduction: Quality of life is a subjective assessment of physical, psychological and social well-being and reflects patients' perceptions about the impact of breast cancer diagnosis and treatment on daily life. Better quality of life is associated with longer survival for patients with various types of cancer.

The purpose of this study was to assess quality of life of women with breast cancer at diagnosis, before mastectomy and 6 months after mastectomy.

Material and Method: The sample of the study consisted of 250 women with breast cancer who underwent mastectomy and had follow up at three hospitals in the area of Attica. Data were collected by the completion of the SF-36 Health Survey scale which included patients' characteristics. The statistical significance level was $p < 0.05$.

Results: Of the sample-studied, 39.2% were below 50 years old, 38.8% were 51-61 years old, and 22% were ≥ 66 years old. Plus to mastectomy, 69.6% underwent adjuvant radiation therapy, 85.6% chemotherapy, and 72.8% hormone therapy. In terms of disease stage, 5.2% was of grade I, 73.2% grade II and 21.6% grade III. Six months after mastectomy, participants reported more negatively all the dimensions of the SF-36 scale with a statistically significant difference ($p < 0.05$), except from mental health dimension, ($p = 0.679$). The dimension of physical functionality was more negatively reported by older women ($p < 0.001$), those of primary education, ($p < 0.001$), the unemployed ($p = 0.001$), those who lived in Attica region ($p = 0.004$), those of grade II and III ($p = 0.008$), and who did not receive adjuvant therapy, ($p = 0.008$). The dimension physical role was more negatively reported by women older than 66 years ($p = 0.041$) and those of primary education ($p = 0.036$). The

dimension physical pain was more negatively reported by those of primary education ($p=0.001$), the unemployed ($p=0.032$), and those of grade III ($p=0.047$). The dimension general health was more negatively reported by women who additionally underwent chemotherapy and radiation ($p<0.001$) and those who were little or no informed about their disease ($p=0.012$) and treatment ($p=0.003$). The dimension of social functioning was more negatively reported by women of primary education ($p=0.003$) and those who lived in a small town or village ($p<0.001$). The dimension emotional role was more negatively reported by women of primary education ($p=0.011$) and those who lived in a small town or village ($p=0.018$). Finally, the change in health was more negatively reported by unmarried/divorced/widows ($p=0.040$).

Conclusion: Quality of life six months after mastectomy is negatively evaluated in all dimensions of SF-36 Health Survey scale, except the mental health dimension. Sociodemographic and clinical factors are associated with quality of life six months after mastectomy. A better understanding of these factors and the overall perception of quality of life is expected to contribute in the planning of rational and cost-effective interventions for this vulnerable female population.

Key-words: Breast cancer, Female, Quality of life, Mastectomy

Introduction

Breast cancer is the most common female cancer in worldwide with approximately 2.3 million new cases, each year. Moreover, is the leading cause of cancer-related mortality, globally.¹

Interestingly, it is observed an upward trend in incidence. For example, in the EU-27, the prevalence of breast cancer varied twicely in 2020^{2,3} while in the United States the number of new cases with breast cancer is expected to reach 364.000 until 2040.¹ It is estimated that one in eleven women in the EU-27 will develop breast cancer before the age of 74 years. These notable figures are attributed to several factors including reproductive issues, obesity, physical inactivity, and detailed screening methods.^{2,3}

According to WHO data, published in 2020, breast cancer deaths in Greece reached 2.520 or 2.50% of total deaths. The age-adjusted death rate is 18.29 per 100,000 of the population, which ranks Greece in 75 position, globally.⁴ Additionally, with regard to Greece, female breast cancer and colon cancer are in the second rank in the new cases of cancer in all ages in both sexes. In women aged 35-55 years, it is the most common cause of death while 1 in 12 women are at risk of developing breast cancer in their lifetime.^{5,6,7}

The global alarming rise of breast cancer is mainly attributed to increased awareness among women, resulting in early diagnosis through prompt participation in subclinical tumour detection programs, as well as to improvements in both diagnostic and therapeutic methods.^{8,9} In support of this view there is evidence that shows 4.500 new cases in Greece, annually.¹⁰ The incidence of the disease is 16.8 new cases per 100.000 women and increases with age.^{6,9,11}

Research has shown that diagnosis and treatment of cancers trigger a variety of emotional disturbance, such as stress, anxiety, fear and major depression, which exert a negative influence on quality of life. According to literature, quality of life varies among patients with similar diseases and treatment approaches which is attributed to several factors particularly psychosocial factors such as perceived social support, resilience and hope. The aforementioned factors reflect the individual's ability to cope with the new state in life. Biological factors (gene-environment), personal factors (e.g. sense of coherence, optimism and hope) and, social factors (e.g. social support) influence the cancer patient's strength and the continuation of treatment.¹²

The World Health Organization (WHO) in 1947 defined Quality of Life as a state of complete physical, mental

and social well-being, not just the absence of disease and disability. In 1995 WHO defined quality of life as the individual's perception of his/her situation in life within the cultural context and the value system which he/she lives and in accordance with aspirations, expectations, standards, interests and goals that he/she sets.¹³⁻¹⁷

Quality of life is defined differently by various disciplines, but theoretically it encompasses all aspects of a person's life. The concept of quality of life is broad and multidimensional since it encompasses personal preferences, experiences, perceptions and attitudes regarding philosophical, cultural, spiritual, psychological, economic, political and interpersonal dimensions of everyday life. Quality of life is defined as the product of an individual's natural endowments combined with the influence of family and society, while other definitions include the personal option of positive and negative characteristics that define a person's life.¹⁸

Despite recent advances in tumor screening and therapy, mastectomy remains the surgical treatment of choice in 20–30% of women with breast cancer. which may adversely affect their quality of life.¹⁷ Therefore, it is necessary to explore women's quality of life after surgery, as they confront with many challenges.

Purpose

The aim of this study was to assess quality of life of women with breast cancer at diagnosis/before mastectomy and 6 months after mastectomy.

Material and Method

Study sample

In the present study were enrolled 250 women with breast cancer who underwent mastectomy and had a follow-up at two public hospitals and on private hospital in the area of Attica. The present study was of cross-sectional design in which the convenience sampling was used. Criteria for participants' inclusion in the study were as follows: a. the procedure of mastectomy, b. no other chronic disease, c. ability to write, read, and understand the Greek language and d. will to participate in the study.

Data collection and procedure

Collection of data was performed using the method of interview to complete the research instrument. Quality of life was explored before mastectomy when the diagnosis of breast cancer was set (1st measurement) and six months after mastectomy (2nd measurement).

The process of filling out the research instrument lasted approximately between 20 and 30 min.

Research instrument

The research instrument included participants' characteristics and the Short Form-36 Health Survey (SF-36). SF-36 is a widely accepted psychometric tool, used in several countries to explore quality of life as perceived by individuals and to compare the level of health among different populations, such as healthy individuals and patients of various illness or between different treatments of patients with the same disease. It includes 36 questions, which were collected, processed and finally selected by the researchers of the Medical Outcomes Study (MOS) from a set of 149 questions. Furthermore, it was formed after evaluating various measurement tools exploring quality of life, mainly used the last 20 years.¹⁹

The 36 questions of the SF-36 are categorized into eight thematic measurement subscales (health dimensions), consisting of 2-10 questions each. Responses to each question are rated on a scale of 1 to 5. Specifically, the eight subscales/dimensions of the SF-36 are:

1. Physical Functioning: Determines whether health level limits physical activities such as walking, climbing stairs, lifting weights (10 questions).
 2. Role Physical: Identifies the positive or negative influence of the level of physical health on work and daily activities (4 questions).
 3. Physical Pain: Identifies the intensity of pain and its effect on activities inside and outside home (2 questions).
 4. General Health: Identifies the prospect of maintaining a high level of health and the ability to resist illness (5 questions).
 5. Vitality: Identifies the feeling of fatigue or correspondingly of energy (4 questions).
 6. Social Functioning: Determines the degree to which social activities are influenced by emotional health and emotional disturbance (2 questions).
 7. Role Emotional: Identifies the degree to which work and other daily activities are affected by emotional disturbance (3 questions).
 8. Mental Health: Identifies general mental health including depression, anxiety, and control of behavioral emotions (5 questions).
- The SF-36 has been translated into Greek language and statistical validity and reliability tests have been successfully performed, both using a small convenience

TABLE 1. Distribution of the sample according to socio-demographic characteristics

SOCIO-DEMOGRAPHIC CHARACTERISTICS		n	%
Age	≤50 years old	98	39,2
	51-65	97	38,8
	60+	55	22,0
Marital status	Married/cohabitation	157	62,8
	Unmarried	20	8,0
	Divorced/divorced	36	14,4
	Widow	37	14,8
Education	Primary education	72	28,8
	Secondary education	117	46,8
	Higher education/postgraduate studies	61	24,4
Occupation	Unemployed/household	107	42,8
	Civil servant	30	12,0
	Private employee	40	16,0
	Freelance	26	10,4
	Other/pensioner	47	18,8
Place of residence	Attica region	82	32,8
	Prefecture capital	122	48,8
	Small town	29	11,6
	Village	17	6,8
Number of children	None	42	16,8
	One	43	17,2
	Two	134	53,6
	>of two	31	12,4
Age of children	<18 years old	57	27,4
	≥18 years old	151	72,6

sample and a representative sample of the Greek urban population.¹⁹

Higher score values indicate a better quality of life. Scores higher than 50 are considered better than those of the general population, while those less than 50 are considered worse.¹⁹

Ethics of research

The present study was approved by the Research Committee of the hospitals that took place and was conducted according to the ethical standards of the Declaration of Helsinki (1989) of the World Medical Association. Patients who met the entry criteria were informed by the researcher for the purposes of this study.

All patients entered the study after they had given their written consent. Data collection guaranteed anonymity and confidentiality. All subjects had been informed of their rights to refuse or discontinue participation in the study, Data confidentiality and personal data policy were also respected.

Statistical analysis

Categorical data are presented with absolute and relative (%) frequencies. For quantitative variables, the t-test and anova statistical test was used depending on the variables, as well as the paired samples test. The Kolmogorov-Smirnov criterion was used to test the normality of continuous variables. The 5% level of

TABLE 2. Distribution of the sample according to clinical characteristics

CLINICAL CHARACTERISTICS		n	%
Comorbidity	Yes	101	40,4
	No	149	59,6
Type of comorbidity	Hypertension	26	10,4
	Diabetes mellitus	32	12,8
	Hypothyroidism	25	10,0
	Other	18	7,2
Disease location	Right breast	99	39,6
	Left breast	144	57,6
	Both	7	2,8
Stage of malignancy	Grade I	13	5,2
	Grade II	183	73,2
	Grade III	54	21,6
Post-operative treatment	Chemotherapy	214	85,6
	Radiation	174	69,6
	Hormone therapy	182	72,8
Onset from breast cancer	Less than a month	129	51,6
	1-3 months	81	32,4
	More than three months	40	16,0
Relatives with breast Ca	Yes	93	37,2
	No	157	62,8
Relatives with same disease	Sister	23	9,2
	Mother	28	11,2
	Aunty	29	11,6
	Grandmother	12	4,8
Degree of information about health problem	Very	46	18,4
	Quite a lot	92	36,8
	A little	78	31,2
	Not at all	34	13,6
Degree of information about the type of treatment	Very	28	11,2
	Quite a lot	65	26,0
	A little	73	29,2
	Not at all	84	33,6

significance was considered statistically significant. All statistical analyses were performed with the SPSS statistical package version 25.

Results

Descriptive results

The sample of the study consisted of 250 women with breast cancer of whom 39.2% were less than 50 years of age, 38.8% were 51-61 years old and 22% were ≥60

years old. In terms of marital status, 61.6% were married, 8% unmarried, 14.4% divorced, 14.8% widowed and 1.2% cohabiting. Regarding level of education, 28.8% were of primary school graduates, 46.8% secondary or post-secondary school graduates and 24.4% higher education graduates. In regard to employment status, 42.8% of participants were unemployed or engaged with household, 12% were civil servants, 16% were private employees, 10.4% were self-employed and 18.8% were

TABLE 3. Comparison of the mean values of the SF-36 scale stretches before and 6 months after mastectomy in the whole sample

DIMENSIONS OF SF-36	Total score before and six months after mastectomy and its difference				
	Before		After	Difference	p
	n	$\bar{x} \pm SD$	$\bar{x} \pm SD$	$\bar{x} \pm SD$	
Physical Functioning	105	82,5±24,2	67,7±23,6	14,8±18,2	<0,001
Role Physical	105	76,8±40,8	25,4±43,9	51,4±51,5	<0,001
Physical Pain	105	84,0±20,5	71,2±20,4	12,8±20,5	<0,001
General Health	105	53,5±8,6	51,7±8,1	1,7±7,9	0,001
Vitality	105	44,8±12,1	46,3±9,9	-1,5±11,8	0,048
Social Functioning	105	78,2±26,0	67,2±28,1	11,0±20,8	<0,001
Role Emotional	105	74,5±41,7	32,7±39,8	41,9±47,8	<0,001
Mental Health	105	42,4±10,2	43,1±26,0	-0,7±25,7	0,679
Health change	105	45,2±14,6	41,3±17,0	3,9±19,8	0,002

retired. With respect to residence, 32.8% lived in Attica region, 48.8% in the capital of a prefecture, 11.6% in a small town and 6.8% in a village. As far as children is concerned, 16.8% of participants had no children, 17.2% had 1 child, 53.6% two and 12.4% had three or more children. The age of their children in 27.4% were below 18 years and in 72.4% ≥ 18 years old (Table 1).

Regarding diagnosis in 39.6% presented right breast cancer, in 57.6% left breast, and 2.8% in both breasts. Moreover, 41.6% of the sample was taking antihypertensive drugs, 21.8% antidiabetic, 10.9% other drugs and 24.7% were receiving thyroid medicine.

In terms of time since breast cancer onset, in 51.6% of participants was less than one month, in 32.4% less than three months and more than three months in 16%. Regarding relatives with breast cancer, 37.2% of participants reported that a person in family suffered from the same disease and of those who suffered 8.8% were a sister and another relative, 16.8% were an aunty and someone else and 11.6% were a mother and someone else.

In regard to comorbidity, 40.4% were suffering from some other disease, of whom 25.7% reported hypertension and diabetes mellitus, 31.7% diabetes mellitus, 24.8% hypothyroidism and 17.8% suffered from other diseases. As far as degree of information is concerned, 18.4% of participants reported to be very well informed about their health problem, 36.8% quite well informed, 31.2% somewhat informed and 13.6% not at all informed. Similarly, the degree of information about their treatment was 11.2%, 26.0%, 29.2% and 33.6%, respectively.

All women had undergone mastectomy. Furthermore, 69.6% of participants underwent plus radiation and of these, 34.8% underwent less than 20 radiation sessions and 35.2% ≥21 sessions, while 30% underwent no radiation. Similarly, 85.6% underwent and with regard to sessions, 14% did not undergo any chemotherapy, 18.4% underwent one to seven, 55.6% underwent eight and 12% underwent nine or more sessions.

Regarding the stage of breast cancer, 5.2% of participants was of grade I, 73.2% grade II and 21.6% grade III while 72.8% of participants received hormone therapy (Table 2).

Statistical results

The application of the t-test, pear t-test and Anova statistic to compare the quality of life of the patients at diagnosis of breast cancer and before mastectomy (1st measurement) and six months after mastectomy (2nd measurement) found that the participants scored negatively with a statistically significant difference on all dimensions of the SF-36 scale, p<0.05, except from mental health dimension, p=0.679 (Table 3).

In relation to age, statistically significant differences were found in physical functioning, where participants below 50 years old reported better quality of life on this dimension, both at 1st and 2nd measurement, p<0.001, respectively. No statistically significant difference was found in physical functioning at 1st and 2nd measurement between age groups, p>0.05, but there was a statistically significant difference between 1st and 2nd measurement within the same age group p<0.001, respectively.

In the subscale of physical role, younger age group

TABLE 4. Comparison of the mean values of the SF36 subscales, before mastectomy and 6 months after, as well as the difference between them, in relation to the age of the sample

DIMENSIONS OF SF-36		AGE						p
		≤50 years		51-65		≥66		
		n	$\bar{X} \pm SD$	N	$\bar{X} \pm SD$	n	$\bar{X} \pm SD$	
Physical Functioning	Before	98	92,0±12,8	97	81,1±24,3	55	68,2±31,2	<0,001
	6month	98	78,6±16,1	97	65,1±23,9	55	52,9±25,1	<0,001
	Difference	98	-13,4±16,0	97	-16,0±19,8	55	-15,3±21,5	0,595
			p<0,001		p<0,001		p<0,001	
Role Physical	Before	98	83,7±35,9	97	79,9±37,8	55	59,1±48,9	0,001
	6month	98	33,4±46,4	97	22,9±45,0	55	15,5±34,8	0,041
	Difference	98	-50,3±49,5	97	-57,0±53,1	55	-43,6±51,9	0,298
			p<0,001		p<0,001		p<0,001	
Physical Pain	Before	98	86,5±18,4	97	85,5±19,6	55	77,0±24,1	0,015
	6month	98	72,7±18,6	97	71,0±22,4	55	68,8±19,7	0,525
	Difference	98	-13,8±21,4	97	-14,5±19,6	55	-8,2±20,4	0,158
			p<0,001		p<0,001		p=0,004	
General Health	Before	98	54,1±8,7	97	52,6±7,0	55	53,9±10,5	0,410
	6month	98	51,9±8,7	97	51,2±7,9	55	52,3±7,5	0,717
	Difference	98	-2,2±8,3	97	-1,3±6,4	55	-1,6±9,4	0,749
			p=0,011		p=0,042		P=0,204	
Vitality	Before	98	45,7±11,2	97	43,6±12,0	55	45,5±13,6	0,417
	6month	98	46,9±10,1	97	46,6±10,1	55	44,6±9,2	0,360
	Difference	98	1,2±11,6	97	3,0±12,9	55	-0,8±9,8	0,147
			p=0,297		p=0,022		p=0,538	
Social Functioning	Before	98	81,6±25,5	97	79,6±24,5	55	69,3±27,9	0,014
	6month	98	70,9±28,3	97	66,5±27,2	55	61,6±28,7	0,137
	Difference	98	-10,7±21,2	97	-13,1±20,4	55	-7,7±20,9	0,301
			p<0,001		p<0,001		p=0,008	
Role Emotional	Before	98	82,0±37,1	97	76,3±40,2	55	58,2±47,7	0,003
	6month	98	40,1±43,6	97	28,5±36,3	55	26,7±37,1	0,056
	Difference	98	-41,8±49,8	97	-47,8±44,6	55	-31,5±48,6	0,131
			p<0,001		p<0,001		p<0,001	
Mental Health	Before	98	43,6±10,6	97	42,9±8,8	55	39,6±11,5	0,064
	6month	98	45,5±11,1	97	41,6±39,7	55	41,5±8,8	0,504
	Difference	98	2,0±10,5	97	-1,3±39,3	55	1,9±9,0	0,622
			p=0,068		p=0,742		p=0,124	
Change in health between 1 st and 2 nd measurement	Before	98	47,2±11,3	97	44,3±14,2	55	43,2±19,5	0,200
	6month	98	40,8±15,4	97	41,8±17,6	55	41,4±18,8	0,929
	Difference	98	-6,4±18,4	97	-2,8±19,3	55	-1,8±23,0	0,279
			p=0,001		p=0,191		p=0,560	

TABLE 5. Comparison of the mean values of the SF36 subscales, before mastectomy and 6 months after, as well as their difference, in relation to marital status of the sample

DIMENSIONS OF SF-36		MARITAL STATUS				p
		Married/cohabitation		Unmarried/divorced		
		n	$\bar{X} \pm SD$	n	$\bar{X} \pm SD$	
Physical Functioning	Before	157	84,8±22,2	93	78,7±26,9	0,054
	6month	157	69,8±21,9	93	64,1±25,9	0,062
	Difference	157	-15,0±19,1	93	-14,6±16,7	0,885
		p<0,001		p<0,001		
Role Physical	Before	157	79,3±38,9	93	72,6±43,6	0,209
	6month	157	26,3±46,1	93	23,9±40,2	0,684
	Difference	157	-53,0±53,7	93	-48,6±47,8	0,518
		p<0,001		p<0,001		
Physical Pain	Before	157	84,5±19,6	93	83,2±21,9	0,631
	6month	157	73,0±20,0	93	68,1±20,1	0,070
	Difference	157	-11,5±20,6	93	-15,1±20	0,188
		p<0,001		p<0,001		
General Health	Before	157	53,6±8,1	93	53,3±9,3	0,776
	6month	157	51,5±7,6	93	52,2±9,0	0,539
	Difference	157	-2,1±7,3	93	-1,1±8,8	0,347
		p=0,011		p=0,219		
Vitality	Before	157	44,5±11,7	93	45,4±12,6	0,576
	6month	157	45,8±9,9	93	47,1±10,0	0,328
	Difference	157	1,3±12,4	93	1,7±10,7	0,805
		p=0,180		p=0,124		
Social Functioning	Before	157	80,2±24,3	93	74,7±28,5	0,110
	6month	157	69,4±28,0	93	63,3±27,9	0,096
	Difference	157	-10,7±20,4	93	-11,4±21,6	0,804
		p<0,001		p<0,001		
Role Emotional	Before	157	77,9±40,4	93	68,8±43,4	0,095
	6month	157	32,3±39,5	93	33,3±40,5	0,839
	Difference	157	-45,6±46,7	93	-35,5±49,1	0,104
		p<0,001		p<0,001		
Mental Health	Before	157	42,2±9,7	93	42,9±11,1	0,593
	6month	157	42,2±32,0	93	44,6±9,5	0,485
	Difference	157	0,05±31,5	93	1,7±10,0	0,620
		p=0,984		p=0,099		
Change in health between 1 st and 2 nd measurement	Before	157	45,4±13,5	93	44,9±16,3	0,798
	6month	157	43,0±15,5	93	38,4±19,0	0,040
	Difference	157	-2,4±18,0	93	-6,5±22,4	0,118
		p=0,100		p=0,007		

TABLE 6. Comparison of the mean values of the SF-36, before and 6 months after mastectomy, as well as the difference between them, in relation to education level of the sample

DIMENSIONS OF SF-36		EDUCATION						p
		Primary		Secondary		Higher education		
		n	$\bar{X} \pm SD$	N	$\bar{X} \pm SD$	n	$\bar{X} \pm SD$	
Physical Functioning	Before	72	66,1±30,9	117	89,6±14,9	61	88,4±20,2	<0,001
	6month	72	52,8±26,6	117	73,0±18,9	61	75,1±20,0	<0,001
	Difference	72	-13,3±22,9	117	-16,6±17,4	61	-13,3±12,5	0,349
		p<0,001		p<0,001		p<0,001		
Role Physical	Before	72	61,5±47,3	117	83,3±36,4	61	82,4±36,0	0,001
	6month	72	14,6±40,8	117	31,4±45,5	61	26,6±42,8	0,036
	Difference	72	-46,9±57,4	117	-51,9±48,8	61	-55,7±50,0	0,608
		p<0,001		p<0,001		p<0,001		
Physical Pain	Before	72	75,4±24,5	117	87,3±17,9	61	87,8±16,9	<0,001
	6month	72	63,8±20,1	117	74,3±19,4	61	73,9±20,6	0,001
	Difference	72	-11,7±22,1	117	-13,0±20,7	61	-13,9±18,5	0,823
		p<0,001		p<0,001		P<0,001		
General Health	Before	72	52,8±9,9	117	53,9±8,5	61	53,4±6,9	0,695
	6month	72	51,3±8,5	117	52,3±8,0	61	51,1±7,95	0,570
	Difference	72	-1,5±8,9	117	-1,6±7,7	61	-2,3±6,9	0,812
		p=0,171		p=0,025		p=0,012		
Vitality	Before	72	44,5±13,6	117	45,2±11,0	61	44,4±12,2	0,889
	6month	72	45,9±10,0	117	46,1±9,0	61	47,2±11,4	0,707
	Difference	72	1,4±11,2	117	0,9±11,8	61	2,8±12,6	0,584
		p=0,285		p=0,434		p=0,089		
Social Functioning	Before	72	66,8±29,0	117	82,5±22,7	61	83,2±24,4	<0,001
	6month	72	57,6±29,1	117	71,2±26,7	61	70,5±27,2	0,003
	Difference	72	-9,2±22,8	117	-11,2±19,4	61	-12,7±21,1	0,621
		P=0,001		p<0,001		P<0,001		
Role Emotional	Before	72	55,1±47,9	117	84,9±34,6	61	77,6±38,8	<0,001
	6month	72	20,8±31,4	117	37,3±43,1	61	37,7±39,7	0,011
	Difference	72	-34,3±48,4	117	-47,6±46,6	61	-39,9±48,6	0,165
		p<0,001		p<0,001		p<0,001		
Mental Health	Before	72	44,4±9,3	117	41,6±10,6	61	41,7±10,2	0,140
	6month	72	45,2±9,8	117	44,2±10,1	61	38,6±49,7	0,294
	Difference	72	0,72±9,0	117	2,6±9,2	61	-3,1±49,5	0,376
		p=0,500		p=0,003		p=0,629		
Change in health between 1 st and 2 nd measurement	Before	72	42,4±18,1	117	45,5±11,2	61	48,0±15,3	0,084
	6month	72	39,2±19,1	117	42,7±13,6	61	41,0±19,9	0,384
	Difference	72	-3,1±21,0	117	-2,8±17,0	61	-7,0±23,3	0,380
		p=0,210		p=0,080		p=0,023		

TABLE 7. Comparison of the mean values of the SF36 scale stretches, before mastectomy and 6 months after, as well as the difference between them, in relation to occupation of the sample

DIMENSIONS OF SF-36		OCCUPATION												p
		Unemployed/ household		Civil servant		Private employee		Freelance		Pensioner				
		n	$\bar{x} \pm SD$	n	$\bar{x} \pm SD$	n	$\bar{x} \pm SD$	n	$\bar{x} \pm SD$	n	$\bar{x} \pm SD$	n	$\bar{x} \pm SD$	
Physical Functioning	Before	107	75,6±27,3	30	84,7±25,4	40	91,1±14,8	26	91,3±15,3	47	84,9±22,3	0,001		
	6month	107	63,4±24,8	30	67,7±27,0	40	77,4±17,1	26	79,0±19,5	47	63,1±21,4	0,001		
	Difference	107	-12,2±18,7	30	-17,0±20,1	40	-13,8±14,0	26	-12,3±16,1	47	-21,8±18,8	0,035		
Role Physical	Before	107	67,=1±45,6	30	82,5±34,2	40	83,8±36,5	26	92,3±27,2	47	80,9±38,7	0,016		
	6month	107	26,2±468	30	30,0±45,2	40	21,9±41,3	26	42,3±48,9	47	14,4±32,9	0,114		
	Difference	107	-40,9±54,1	30	-52,5±51,0	40	-61,9±48,0	26	-50,0±49,5	47	-66,5±45,8	0,036		
Physical Pain	Before	107	71,6±23,8	30	87,7±16,8	40	88,8±16,0	26	87,2±17,4	47	85,9±18,0	0,055		
	6month	107	66,8±21,6	30	76,3±21,0	40	76,9416,3	26	75,2±23,9	47	71,2±16,2	0,032		
	Difference	107	-12,8±20,7	30	-11,3±19,9	40	-12,4±19,5	26	-12,0±22,0	47	-14,7±21,2	0,961		
General Health	Before	107	53,6±8,8	30	53,8±7,6	40	54,6±10,2	26	54,8±7,0	47	51,2±7,8	0,303		
	6month	107	51,8±8,5	30	52,2±7,8	40	51,8±8,7	26	52,3±8,4	47	51,1±6,9	0,970		
	Difference	107	-1,9±9,2	30	-1,7±6,3	40	-2,9±6,0	26	-2,5±7,1	47	-01±7,6	0,542		
Vitality	Before	107	46,4±13,6	30	41,8±10,4	40	45,6±12,0	26	46,0±6,5	47	41,9±11,2	0,151		
	6month	107	46,3±8,7	30	44,7±12,4	40	48,3±11,8	26	42,9±9,1	47	47,7±9,0	0,174		
	Difference	107	0,1±11,7	30	2,8±13,2	40	2,6±11,7	26	-3,1±10,8	47	5,8±10,6	0,012		
Social Functioning	Before	107	72,9±27,7	30	78,3±23,7	40	82,8±26,4	26	88,9±19,8	47	80,1±24,3	0,033		
	6month	107	63,3±29,0	30	70,0±25,3	40	70,0±30,3	26	76,0±25,2	47	66,8±26,6	0,260		
	Difference	107	-9,6±20,7	30	-8,3±17,5	40	-12,8±24,3	26	-13,0±19,2	47	-13,3±21,0	0,720		

Role Emotional	Before	107	65,4±45,5	30	71,1±43,5	40	84,1±36,3	26	89,7±29,5	47	80,9±37,3	0,016
	6month	107	31,8±39,5	30	35,6±41,9	40	28,3±38,9	26	52,6±44,4	47	25,5±34,9	0,068
	Difference	107	-33,6±45,2	30	-35,6±76,6	40	-55,8±45,5	26	-37,2±47,4	47	-55,3±45,7	0,024
Mental Health	Before	107	42,8±10,7	30	40,5±8,7	40	44,4±11,3	26	42,5±11,1	47	42,0±8,4	0,467
	6month	107	44,7±9,8	30	44,1±9,1	40	47,6±11,4	26	43,7±11,7	47	34,6±55,8	0,156
	Difference	107	1,9±9,3	30	3,6±9,1	40	3,2±10,6	26	1,2±9,8	47	-6,4±55,8	0,336
Change in health between 1 st and 2 nd measurement	Before	107	44,6±15,0	30	46,7±14,2	40	47,5±11,0	26	45,2±12,3	47	43,6±17,7	0,736
	6month	107	39,7±17,5	30	43,3±13,0	40	43,1±16,0	26	39,4±18,9	47	43,1±17,8	0,619
	Difference	107	-4,9±20,4	30	-3,3±12,7	40	-4,4±20,3	26	-5,9±17,8	47	-0,5±23,0	0,756

scored higher at 1st and 2nd measurement p=0.001 and p=0.041, respectively, with a statistically significant difference in each group between 1st and 2nd measurement, p<0.001, respectively. Also statistically significant differences were found in physical pain where participants over 66 years old scored negatively p=0.015 while no statistically significant differences were found between 1st and 2nd measurement. Similarly, each age group scored negatively on 2nd measurement with a statistically significant difference, p<0.001, p<0.001, and p=0.004, respectively. Regarding social functioning the same age group scored lower on SF 36 scale, p=0.014, while no statistically significant differences were found at 2nd measurement, but with a statistically significant difference between the 1st and 2nd measurement, p<0.001, p<0.001, and p=0.008, respectively. Regarding emotional role at 1st measurement, participants over 66 years old scored negatively p=0.003, but with a statistically significant difference between 1st and 2nd measurement, p<0.001, respectively. No statistically significant differences were found in other dimensions of the scale p>0.05 (Table 4).

Regarding marital status, a statistically significant borderline difference was found in change of health, at 2nd measurement, where the single, divorced and widowed reported more negatively health p=0.040 while no statistically significant differences were found in the assessment of scale at 1st and 2nd measurement, p>0.05. Table 5 presents the differences between 1st and 2nd measurement separately in each group.

In terms of educational level, primary school graduates reported physical functioning more negatively at 1st and 2nd measurement, p<0.001 and p=0.036. On physical pain, primary school graduates scored more negatively at 1st and 2nd measurement, p<0.001 and p=0.001. Similarly, on social functioning, p<0.001 and p=0.003 and on emotional role at 1st measurement, p<0.001 and at 2nd measurement p=0.011. No statistically significant differences were found in other dimensions of the scale, but statistically significant differences were found in the same group between 1st and 2nd measurement (Table 6).

With respect to occupation, statistically significant differences were found in physical functioning at 1st measurement, where unemployed women and those involved with household scored more negatively, p=0.001. Similarly at 2nd measurement, the unemployed, the retired and women engaged with household, p=0.001, while a greater difference was found between 1st and 2nd measurement in retired participants,

TABLE 8. Comparison of the mean values of the SF36 scale stretches before and 6 months after mastectomy, as well as the difference between them, in relation to place of residence of the sample

DIMENSIONS OF SF-36		RESIDENCY						p
		Attica region		Prefecture capital		Small town/village		
		n	$\bar{X} \pm SD$	n	$\bar{X} \pm SD$	n	$\bar{X} \pm SD$	
Physical Functioning	Before	82	74,2±30,1	122	89,0±17,3	46	80,2±23,4	<0,001
	6month	82	60,9±25,1	122	71,9±21,0	46	68,6±24,9	0,004
	Difference	82	-13,3±19,6	122	-17,1±17,0	46	-11,6±18,4	0,143
		p<0,001		p<0,001		p<0,001		
Role Physical	Before	82	71,6±43,9	122	81,8±37,2	46	72,8±43,4	0,170
	6month	82	33,5±44,8	122	19,7±43,0	46	26,1±43,4	0,086
	Difference	82	-38,1±48,6	122	-62,1±51,7	46	-46,7±50,7	0,004
		p<0,001		p<0,001		p<0,001		
Physical Pain	Before	82	81,6±23,6	122	86,8±17,6	46	80,9±21,2	0,107
	6month	82	71,9±21,3	122	70,0±19,0	46	72,9±22,4	0,669
	Difference	82	-9,7±23,9	122	-16,8±18,1	46	-8,0±18,3	0,011
		p<0,001		p<0,001		P=0,005		
General Health	Before	82	54,0±10,0	122	53,3±6,9	46	53,0±9,9	0,810
	6month	82	52,7±8,4	122	51,1±7,4	46	51,7±9,3	0,351
	Difference	82	-1,2±9,6	122	-2,3±7,1	46	-1,3±6,3	0,604
		p=0,255		p=0,001		p=0,165		
Vitality	Before	82	47,2±11,9	122	43,2±12,3	46	44,8±12,0	0,071
	6month	82	46,6±10,0	122	46,3±9,8	46	45,7±10,1	0,863
	Difference	82	-0,5±9,8	122	3,1±13,6	46	0,7±9,5	0,092
		p=0,612		p=0,014		p=0,538		
Social Functioning	Before	82	70,3±28,4	122	84,9±21,2	46	74,2±28,7	<0,001
	6month	82	57,2±25,3	122	73,6±26,9	46	67,9±31,3	<0,001
	Difference	82	-13,1±22,8	122	-11,4±19,9	46	-6,3±19,1	0,195
		P<0,001		p<0,001		P=0,032		
Role Emotional	Before	82	69,9±43,7	122	79,2±38,4	46	70,3±45,7	0,220
	6month	82	42,3±43,2	122	26,2±35,7	46	32,6±41,3	0,018
	Difference	82	-27,6±47,7	122	-53,0±44,5	46	-37,7±50,0	0,001
		p<0,001		p<0,001		p<0,001		
Mental Health	Before	82	42,0±10,5	122	42,3±9,6	46	43,5±11,3	0,727
	6month	82	43,1±8,9	122	42,2±36,0	46	45,7±10,9	0,742
	Difference	82	1,1±9,7	122	-0,2±35,6	46	2,2±8,1	0,859
		p=0,319		p=0,960		p=0,075		
Change in health between 1 st and 2 nd measurement	Before	82	44,8±17,5	122	46,1±12,0	46	43,5±15,3	0,559
	6month	82	41,8±17,1	122	41,6±16,6	46	39,7±17,9	0,771
	Difference	82	-3,0±24,0	122	-4,5±17,6	46	-3,8±17,5	0,876
		p=0,254		p=0,005		p=0,146		

TABLE 9. Comparison of the mean values of the SF36 scale stretches, before mastectomy and 6 months after, as well as the difference between them, in relation to the stage of malignancy of the sample

ΔΙΑΣΤΑΣΕΙΣ ΚΛΙΜΑΚΑΣ SF36		STAGE OF MALIGNANCY						p
		Grade I		Grade II		Grade III		
		n	$\bar{X} \pm SD$	n	$\bar{X} \pm SD$	n	$\bar{X} \pm SD$	
Physical Functioning	Before	13	96,9±6,0	183	82,0±24,2	54	80,8±25,8	0,083
	6month	13	87,3±14,1	183	66,6±23,6	54	66,9±23,7	0,008
	Difference	13	-9,6±12,5	183	-15,5±18,7	54	-14,0±17,6	0,497
Role Physical	Before	13	82,7±34,4	183	74,9±42,3	54	81,9±36,8	0,464
	6month	13	38,5±50,6	183	22,7±40,5	54	31,5±52,6	0,237
	Difference	13	-44,2±56,0	183	-52,2±49,5	54	-50,5±57,8	0,856
Physical Pain	Before	13	90,8±10,1	183	84,8±20,0	54	79,7±23,2	0,132
	6month	13	82,9±12,8	183	71,4±20,1	54	67,5±22,3	0,047
	Difference	13	-7,9±14,0	183	-13,4±20,9	54	-12,2±20,6	0,632
General Health	Before	13	54,6±9,9	183	53,1±8,7	54	54,4±7,8	0,537
	6month	13	54,6±7,5	183	51,6±8,0	54	51,6±8,6	0,424
	Difference	13	0,0±9,1	183	-1,5±8,3	54	-2,9±6,0	0,395
Vitality	Before	13	41,2±14,7	183	45,2±11,6	54	44,4±12,9	0,478
	6month	13	41,9±7,8	183	46,0±9,8	54	48,2±10,2	0,093
	Difference	13	0,8±15,4	183	0,8±10,9	54	3,9±13,5	0,239
Social Functioning	Before	13	88,5±11,9	183	77,9±25,5	54	76,6±29,6	0,325
	6month	13	79,8±18,8	183	68,0±74,7	54	61,3±30,2	0,077
	Difference	13	-8,7±18,7	183	-9,9±20,0	54	-15,3±23,8	0,229
Role Emotional	Before	13	79,5±34,8	183	73,4±42,3	54	77,2±41,4	0,768
	6month	13	38,5±44,8	183	32,4±39,8	54	32,0±39,4	0,864
	Difference	13	-41,0±61,1	183	-41,0±48,1	54	-45,1±44,0	0,858
Mental Health	Before	13	43,4±10,4	183	42,1±10,1	54	43,2±10,8	0,759
	6month	13	45,5±9,7,1	183	42,0±29,7	54	46,2±10,8	0,547
	Difference	13	2,2 ±10,9	183	-0,1±29,3	54	3,0±10,6	0,713
Change in health between 1 st and 2 nd measurement	Before	13	46,2±9,4	183	45,5±14,5	54	44,0±16,1	0,778
	6month	13	46,2±9,4	183	41,1±17,6	54	40,7±16,3	0,567
	Difference	13	0,0±10,2	183	-4,4±20,5	54	-3,2±19,5	0,719

p=0.035. In physical role, also, the same group scored lower at 1st measurement, p=0.016, while a greater difference between 1st and 2nd measurement was also observed in retired participants, p=0.055 and p=0.032, respectively. In vitality, a greater statistically significant difference was observed in retired participants, p=0.012. In the subscale of social functioning, unemployed and those engaged in household scored more negatively at 1st measurement, p=0.033. In subscale of emotional role at 1st measurement, the unemployed and those engaged in household scored more negatively, p=0.016, while

the greatest negative difference was observed in private employees, p=0.024. Similarly in each group were found statistically significant differences between 1st and 2nd measurement (Table 7).

As far as the place of residence is concerned, it was found that participants living in the Attica region reported physical functioning more negatively at 1st and 2nd measurement, p<0.001 and p=0.004, with the most negatively difference was reported by individuals residing in the capital of a prefecture, p=0.004 similarly in physical pain, p=0.011. Regarding social functioning,

TABLE 10. Comparison of the mean values of the SF36 scale stretches, before mastectomy and 6 months after, as well as the difference between them, in relation to the type of treatment of the sample

DIMENSIONS OF SF-36	TYPE OF TREATMENT											
	Only one kind of treatment			Chemotherapy and hormone therapy			Chemotherapy and radiation			Chemotherapy/ Radiotherapy/		
	n	$\bar{X} \pm SD$	P	n	$\bar{X} \pm SD$	P	n	$\bar{X} \pm SD$	P	n	$\bar{X} \pm SD$	P
Physical Functioning	Before	44	77,5±25,8	51	88,4±21,5		58	84,1±22,8		97	80,8±25,	0,129
	6month	44	59,7±26,7	51	76,0±18,2		58	65,9±23,6		97	68,1±23,5	0,008
	Difference	44	-17,8±20,3	51	-12,5±16,0	P<0,001	58	-18,2±18,6	P<0,001	97	-12,7±17,8	0,148
Role Physical	Before	44	67,0±45,4	51	82,4±38,5		58	75,9±43,2		97	78,9±38,1	0,292
	6month	44	17,6±37,2	51	32,4±46,4		58	19,8±39,4		97	28,6±47,6	0,251
	Difference	44	-49,4±49,9	51	-50,0±53,6	P<0,001	58	-56,0±49,4	P<0,001	97	-50,3±53,0	0,893
Physical Pain	Before	44	81,4±22,4	51	87,4±18,0		58	81,5±22,5		97	84,9±19,4	0,381
	6month	44	66,5±21,1	51	75,0±19,4		58	70,0±18,7		97	72,0±21,4	0,213
	Difference	44	-14,9±20,1	51	-12,4±21,2	P<0,001	58	-11,5±21,3	P<0,001	97	-12,9±20,1	0,870
General Health	Before	44	53,6±9,2	51	55,5±7,1		58	52,7±8,0		97	52,8±9,3	0,274
	6month	44	52,4±7,4	51	55,1±5,9		58	48,2±7,8		97	51,8±8,8	<0,001
	Difference	44	-1,3±7,1	51	0,4±5,9	p=0,637	58	-4,5±8,4	P<0,001	97	-1,0±8,6	0,023
Vitality	Before	44	46,8±13,3	51	44,4±7,7		58	42,8±12,5		97	45,3±11,9	0,396
	6month	44	43,2±9,3	51	45,3±10,0		58	48,1±8,8		97	47,2±10,5	0,055
	Difference	44	-3,6±12,5	51	-0,9±10,5	p=0,550	58	5,3±10,6	P<0,001	97	1,9±12,1	0,002
Social Functioning	Before	44	75,9±25,3	51	83,6±24,4		58	78,9±26,6		97	75,9±26,7	0,344
	6month	44	67,3±27,8	51	74,8±27,1		58	65,7±29,0		97	63,9±27,8	0,159
	Difference	44	-8,5±20,3	51	-8,8±19,6	P=0,008	58	-13,1±17,9	P<0,001	97	-12,0±23,2	0,572
Role Emotional	Before	44	65,2±46,0	51	83,0±37,3		58	76,4±39,5		97	73,2±42,7	0,207
	6month	44	25,0±36,7	51	45,1±41,5		58	28,7±36,1		97	32,0±41,4	0,065
	Difference	44	-40,2±49,6	51	-37,9±50,8	P=<0,001	58	-47,7±43,7	P<0,001	97	-41,2±48,0	0,734

Mental Health	Before	44	41,3±10,0	51	44,4±8,7		58	42,6±10,4		97	41,8±10,9	0,422
	6month	44	43,3±9,6	51	45,5±9,5		58	47,2±9,8		97	39,3±39,8	0,265
	Difference	44	2,0±9,5	51	1,1±7,9	p=0,327	58	4,6±9,9	p=0,001	97	-2,5±39,5	0,394
Change in health between 1 st and 2 nd measurement	Before	44	44,3±13,1	51	48,0±12,1		58	44,0±12,7		97	44,8±17,3	0,466
	6month	44	40,9±17,1	51	46,1±14,5		58	37,5±15,0		97	41,2±18,8	0,072
	Difference	44	-3,4±19,9	51	-2,0±13,1	p=0,290	58	-6,5±17,2	p=0,006	97	-3,6±23,9	0,684

individuals who lived in the Attica region reported more negatively, at 1st and 2nd measurement, p<0.001, respectively. On emotional role at 2nd measurement, participants residing in the capital county area scored more negatively, p=0.018 and the same group showed the largest difference between the 1st and 2nd measurement, p=0.001. Similarly in each group there were statistically significant differences between 1st and 2nd measurement (Table 8).

No statistically significant differences were found on any dimension of the scale in terms of breast cancer location on the right, left or left side p>0.05.

Regarding staging, participants of grade II and III reported more negatively physical functioning at 2nd measurement, p=0.008, also physical pain, p=0.047 (Table 9).

With regard to the type of treatment plus mastectomy, participants who afterwards underwent chemotherapy and radiotherapy reported more negatively the dimension of physical functioning at 2nd measurement, p=0.008, similarly general health, p<0.001 (Table 10).

Regarding the degree of information about breast cancer, in the dimension of general health participants with little or no information scored more negatively in both assessments at 1st and 2nd measurement, p=0.003 and p=0.012, respectively (Table 11). Similarly, regarding the degree of information about the type of treatment on the same dimension, the same group scored more negatively p=0.044 and p=0.003, respectively (Table 12).

Discussion

Improvements in treatment for female breast cancer have led to longer life spans, but specific health related issues among survivors that impact on patients' quality of life.^{20,21,22} The standard of care of breast cancer in the early stage of the disease is surgery, supplemented by postoperative chemotherapy or radiotherapy, if indicated.²³ Interestingly, quality of life is a crucial measure for cancer patients that is evaluated in many clinical trials to assess effectiveness of treatments.²²

Data analysis showed that participants scored negatively on all dimensions of the SF-36 scale with a statistically significant difference six months after surgery. Several explanations may account for this finding. Indeed, breast cancer patients experience various distress in the following phases: diagnosis, primary treatment, psychological management, issues related to invasive breast cancer, recurrence, completion of treatment and reintegration into normal

TABLE 11. Comparison of the mean values of the SF36 scale stretches, before mastectomy and 6 months after, as well as the difference between them, in relation to the degree of information about treatment of the sample

DIMENSIONS OF SF-36		DEGREE OF INFORMATION ABOUT THE DISEASE				
		Very/quite		A little / not at all		p
		n	$\bar{X} \pm SD$	n	$\bar{X} \pm SD$	
Physical Functioning	Before	138	83,5±22,5	112	81,3±26,1	0,480
	6month	138	68,9±22,6	112	66,2±24,7	0,368
	Difference	138	-14,6±18,7	112	-15,1±17,6	0,819
		p<0,001		p<0,001		
Role Physical	Before	138	79,3±38,7	112	73,7±43,2	0,274
	6month	138	28,1±46,5	112	22,1±40,5	0,286
	Difference	138	-51,3±51,6	112	-51,6±51,7	0,964
		p<0,001		p<0,001		
Physical Pain	Before	138	85,2±19,8	112	82,6±21,3	0,317
	6month	138	72,4±21,4	112	69,6±19,0	0,283
	Difference	138	-12,8±21,8	112	-12,9±18,9	0,948
		P<0,001		p<0,001		
General Health	Before	138	54,9±9,2	112	51,7±7,3	0,003
	6month	138	52,9±8,3	112	50,3±7,7	0,012
	Difference	138	-2,0±7,8	112	-1,4±8,1	0,522
		p=0,003		p=0,072		
Vitality	Before	138	45,8±13,7	112	43,7±9,5	0,171
	6month	138	46,6±10,3	112	45,9±9,4	0,559
	Difference	138	0,9±12,0	112	2,2±11,5	0,376
		p=0,398		p=0,042		
Social Functioning	Before	138	78,1±24,7	112	78,2±27,7	0,962
	6month	138	67,5±26,6	112	66,7±29,9	0,836
	Difference	138	-10,6±19,9	112	-11,5±22,0	0,735
		p<0,001		p<0,001		
Role Emotional	Before	138	74,6±41,6	112	74,4±42,0	0,965
	6month	138	35,5±40,9	112	29,1±38,2	0,211
	Difference	138	-39,1±47,5	112	-45,2±48,2	0,316
		p<0,001		p<0,001		
Mental Health	Before	138	42,6±11,0	112	42,3±9,2	0,839
	6month	138	44,0±10,3	112	42,0±37,2	0,560
	Difference	138	1,4±9,5	112	0,2±36,9	0,610
		p=0,083		p=0,943		
Change in health between 1 st and 2 nd measurement	Before	138	44,4±14,5	112	46,2±14,7	0,327
	6month	138	42,0±16,0	112	40,4±18,1	0,452
	Difference	138	-2,4±19,3	112	-5,8±20,4	0,172
		p=0,154		p=0,003		

TABLE 12. Comparison of the mean values of the SF36 scale stretches, before mastectomy and 6 months after, as well as the difference between them, in relation to the degree of information about the type of treatment in the sample

DIMENSIONS OF SF-36		DEGREE OF INFORMATION ABOUT THE TREATMENT				
		Very/quite		A little / not at all		p
		n	$\bar{X} \pm SD$	n	$\bar{X} \pm SD$	
Physical Functioning	Before	93	83,5±23,5	157	81,9±24,6	0,613
	6month	93	69,2±23,7	157	66,8±23,5	0,426
	Difference	93	-14,3±18,7	157	-15,2±17,9	0,719
		p<0,001		p<0,001		
Role Physical	Before	93	74,7±41,5	157	78,0±40,5	0,538
	6month	93	26,1±42,6	157	25,0±44,8	0,852
	Difference	93	-48,6±47,7	157	-53,0±53,7	0,518
		p<0,001		p<0,001		
Physical Pain	Before	93	83,8±19,8	157	84,1±20,9	0,884
	6month	93	71,9±21,2	157	70,7±19,9	0,664
	Difference	93	-11,8±20,9	157	-13,4±20,3	0,564
		P<0,001		p<0,001		
General Health	Before	93	54,9±9,4	157	52,6±7,9	0,044
	6month	93	53,7±8,8	157	50,6±7,5	0,003
	Difference	93	-1,2±7,9	157	-2,1±7,9	0,391
		p=0,151		p=0,001		
Vitality	Before	93	45,7±14,9	157	44,3±10,1	0,376
	6month	93	46,5±10,7	157	46,2±9,4	0,853
	Difference	93	0,8±12,2	157	1,9±11,6	0,454
		p=0,553		p=0,040		
Social Functioning	Before	93	77,8±25,9	157	78,3±26,1	0,879
	6month	93	67,9±26,9	157	66,7±28,8	0,754
	Difference	93	-9,9±20,2	157	-11,6±21,2	0,539
		p<0,001		p<0,001		
Role Emotional	Before	93	71,0±43,7	157	76,6±40,4	0,299
	6month	93	35,8±41,5	157	30,8±38,8	0,333
	Difference	93	-35,1±48,7	157	-45,9±46,9	0,086
		p<0,001		p<0,001		
Mental Health	Before	93	43,1±12,1	157	42,0±8,9	0,429
	6month	93	43,8±10,9	157	42,7±31,8	0,751
	Difference	93	0,7±10,0	157	0,7±31,5	0,994
		p=0,508		p=0,793		
Change in health between 1 st and 2 nd measurement	Before	93	44,6±15,1	157	45,5±14,3	0,632
	6month	93	40,9±17,2	157	41,6±16,9	0,753
	Difference	93	-3,8±19,1	157	-4,0±20,3	0,933
		p=0,061		p=0,015		

life, survival and palliation for advanced cancer.^{24,25} Furthermore women with breast cancer report a variety of long-term functional changes, such as reduced strength, diminished aerobic capacity and mobility, which are possibly attributed to pain and fatigue during treatment.²⁶ Other long-term complications may include psychological changes, cognitive dysfunction, cardiotoxicity, nephrotoxicity and neurotoxicity, depending on treatment regimens.^{27,28} Equally important are psychological disturbances such as negative body image and altered quality of life.²⁷ Functional status prior to surgery is an important indicator of long-term outcome. Seventy percent of women who underwent axillary lymph node mastectomy had clinically significant impairment in at least one aspect of upper body function at follow-up 7 years later. The loss of grip strength was more pronounced in women who also needed chemotherapy.²⁹ Psychological therapies help patients come to overcome negative feelings and treat mental illnesses.³⁰

However, as quality of life is widely explored, a number of research findings appear to be contradictory. For example, quality of life is not always strongly correlated with physical function and some patients maintain a good quality of life in the presence of significant physical disability. Frequently, patients are willing to tolerate side effects of treatments even if the benefits to survival are negligible.^{31,32} Sharpe et al.,³¹ acknowledged adaption to disease as an important aspect of living with cancer. Frequently, individuals change their priorities and expectations so as to be consistent with current circumstances. Patients recently diagnosed with metastatic cancer acknowledged as important more areas of their lives. Specifically, nearly half (47%) of participants changed their perceived important areas between the initial and second assessment (three months later) while 43% changed their responses between second and third assessment (six months after the initial).³¹ It becomes apparent that different domains of quality of life are affected by several factors such as symptoms, life expectancy as perceived by patients and threat of potential adverse effects of treatment.³⁰ According to the concept of “response shift”, individuals tend to alter the significance of prior areas when experience a serious health threat. Shifting occurs not only when expectations change but also when occur changes in values or conceptualizations.³³

All age groups in almost all scale dimensions scored more negatively on quality of life after six months.

Women older than 66 years of age scored more negatively on physical functioning, physical role, physical pain, social functioning, and emotional role, before mastectomy and six months later similarly on physical functioning and physical role. Younger women rated the emotional role dimension more negatively, as well as they had the greatest change in health. When a woman is diagnosed with cancer, the breast does not serve its’ symbol of beauty, motherhood, and vitality. Depression is frequent at diagnosis of breast cancer with young women to experience more severe depression than the older ones.³⁴ Høyer M et al.,³⁵ attributed younger women’s negative emotional and mental health to economic, family and social factors. Moreover, breast cancer in younger population is more aggressive, with higher mortality and recurrence rates than older women.³⁶ Chung et al.,³⁷ found that women aged 40 years and younger had the worst 5-year cancer-specific survival compared with all older age groups. As noted above in this study women younger than 50 years of age scored more negatively on the dimensions of emotional role and mental health which is consistent with the above study. In addition to survival differences, young age is a predictor of local recurrence with four times higher recurrence among women younger than 45 years compared to those over 65 years. The relative risk of local recurrence increased by 7% for each decreasing year of age in women younger than 40 years of age treated with primary breast-conserving surgery followed by adjuvant radiation with or without chemotherapy.³⁶ Clinically, younger women are more likely to have palpable masses, have larger tumor sizes, more invasive cancers and more positive lymph nodes than older women.³⁶ In addition, younger women have to face family related issues, such as caring for children, occupational demands, financial distress and sexual dysfunction.^{37,38} According to Sammarco³⁹ younger women are more psychologically affected by the disease and experience worse social, emotional functioning, more pain, severe arm dysfunction, more disruption of daily habits and more concerns about their future health course than older women.⁴⁰ Younger and unmarried women are positively associated with poorer mental well-being and more severe depressive symptoms.⁴¹ However, the impact of age on quality of life in breast cancer patients remains a matter of debate, with some studies suggesting that older women may have worse overall quality of life.⁴² Ageing may reduce functional abilities and quality of life which is already

known among older women due to other conditions. Contrariwise, younger individuals are more affected societal beauty standards which are less evident for older individuals.^{43,44}

Acceptance of the disease and therapy is important in cancer treatment. Patients worry about how they will respond to treatment and fear relapse or death. It is important to assess whether they are able to cope with the limitations associated with their illness and remain independent in their daily lives.^{45,46,47} In addition, breast cancer patients struggle to find their place among family members and friends. Mastectomy leaves both physical and psychological scars and women may feel unable to accept their bodies, or anxious that they are no longer sexually attractive. Social support provided by family, relatives and friends influence recovery and prolong patients’ lives.⁴⁸

In the present study, women who underwent mastectomy followed by chemotherapy and radiation had a greater negative report between first and second measurement of quality of life in the dimension of physical functioning, of physical role, of social functioning, and emotional role. Surgery leaves a deformed breast and scar tissue while chemotherapy and radiation therapy are accompanied by weight loss, vomiting, weakness, hair loss and skin discoloration. Hormonal treatment is associated with hot flashes, muscle cramps, joint stiffness, joint pains and loss of libido. Notably, breast cancer treatment is accompanied by concerns about sexuality and fertility.³

Ganz et al.,⁴⁹ demonstrated that women received chemotherapy reported slightly lower SF-36 mental health scores (69.0 vs 72.2) but no difference in SF-36 physical functioning scores, as measured by SF-36 scale. Adjuvant chest wall irradiation after mastectomy remains an effective component of local management of early breast cancer, reducing local recurrence and breast cancer mortality.^{47,50}

In terms of marital status, the unmarried/divorced women rated health change more negatively six months after mastectomy. A finding that is consistent with the study conducted by Konieczny et al.⁵¹ Married women achieve better cognitive function and lower intensity of symptoms, such as nausea and vomiting, pain, shortness of breath, insomnia, lack of appetite, etc. Similarly, Parker et al.,⁵² demonstrated better quality of life among married patients. A study conducted by Croft et al.,⁵³ showed a higher level of optimism in married women after 5 years of diagnosis with breast cancer. The

studies by Cobo-Cuenca et al.,⁵⁴ and Acil et al.,⁵⁵ showed higher life satisfaction among married women which underline the importance of family support in the fight against the disease.

The present data analysis showed that primary school women reported their quality of life more negatively, before and six months after mastectomy, on the dimensions of physical functioning, physical role, physical pain, social functioning, and emotional role. Patients with a low level of education lack the knowledge and skills to seek for up-to-date information about the disease and its’ treatment. Higher levels of education are associated with clear understanding of health guidelines, better ability to identify treatment-induced effects, increased health awareness, and improvements in self-care.^{51,56} Consequently, women with higher levels of education have the opportunity to access treatment that improve their functional abilities and sexual function.

Regarding occupation results showed that unemployed women scored more negatively on all dimensions of SF-36 scale except vitality. This finding is consistent with other studies that do not take occupation as an independent variable, but in conjunction with economic status. Similar results were obtained by Huang et al.,⁵⁷ and Yan et al.,⁵⁸ who demonstrated higher quality of life in breast cancer patients with higher income. Also, Kobayashi et al.,⁵⁹ illustrated higher family income to be positively associated with better quality of life in women. Jendrian et al.,⁶⁰ indicated higher monthly family income and higher occupational qualifications as predictors of good quality of life in women diagnosed with breast cancer.

The results of the study indicated that women who lived in a small town or village reported more negatively the dimension of physical role. This finding can be interpreted in two ways. First, rural women may be more involved in manual work and need more physical strength, which is limited both by the surgery and adjuvant therapy. Second, rural women, due to the lack of health services, may have to travel to be monitored and continue their treatment. Similar results were found in a Polish study involving 250 women with breast cancer which demonstrated that proximity to well-equipped healthcare centers and prompt access to specialist doctors, and health information, lead to a better quality of life.⁶¹

Participants who reported little or no information about their health problem reported their quality of

life more negatively after six months. Knowledge and information was a key factor in assessing quality of life while lack of information triggers fear and anxiety.^{62,63} All patients deserve detailed knowledge about their condition which consists a key factor in breast cancer management.⁶⁴ It is not rare, that women describe living with uncertainty as a result of lack of information about treatment options and symptom management. Major concerns were changes in role functioning, altered relationships and self-image.⁴⁶

Treatment of breast cancer depends on the stage at diagnosis, the size and location of the tumour and the characteristics of the tumour. Those with stage II or III at diagnosis receive extensive cancer treatment and consequently experience higher likelihood or severity of treatment effects.⁶⁵ In the present study, women with grade II and III reported more negatively the dimension of physical functioning and physical pain. Though this finding is consistent with a study conducted in Northeastern Brazil, however, 43.4% of participants had not undergone any treatment other than neoadjuvant chemotherapy. In this study, most of the women did not need help with activities of daily living.⁶⁶

Regarding tumour staging, participants of grade II and III reported more negatively physical functioning at 2nd measurement, also physical pain. More advanced stages of breast cancer at the time of diagnosis combined with diminished role, physical and emotional functioning have been associated with a higher likelihood of worse quality of life.⁶⁷ Women with early stage breast cancer showed better general health status and better physical, emotional, cognitive and social functioning than those with breast cancer in later stages. Women with later

stage of breast cancer experience severe symptoms.⁶⁸

Limitations of the study

The method of convenience sampling in hospitals in Attica is not representative of all breast cancer survivors living in Greece, thus limiting the generalizability of the results. Although many significant associations were observed, the sample size might be a small one. Also, no account was taken of whether there was metastasis or relapse of the disease in the six-month period. Also, the reliability of the responses depends on the honesty of the participants which means that responses may be biased, and answers may have been given that are considered more correct. The SF-36 scale is a widely used tool that will help to compare the results with other research studies on a global scale.

Conclusions

Breast cancer negatively affects all dimensions of quality of life. In the present study, women scored negatively on all dimensions of the SF-36 scale except the mental health dimension. Independent factors influencing the assessment of quality of life are age, educational level, marital status, stage of disease, type of treatment, level of awareness, place of residence etc.

Therefore, it is necessary to identify the high-risk group for poor quality of life and to provide psychosocial interventions with ultimate goal to enhance their quality of life. Women require special care from a multidisciplinary health team. A multidisciplinary approach should be used to address practical concerns focused on improving quality of life.

ABSTRACT

Ποιότητα ζωής γυναικών με καρκίνο μαστού, έξι μήνες μετά τη μαστεκτομή

Μαρία Καράογλου¹, Γεώργιος Αθανασάς², Νικόλαος Δανιάς³, Ελένη Κυρίτση⁴, Δημήτριος Παπαγεωργίου⁵, Νίκη Παυλάτου⁶, Μαρία Πολυκανδριώτη⁷

¹Νοσηλεύτρια, Mrs, υποψήφια διδάκτωρ. 1ο Κέντρο Υγείας Ελευσίνας

²Αναπληρωτής Καθηγητής, Ιατρική Σχολή, ΕΚΠΑ

³Αναπληρωτής Καθηγητής, Ιατρική Σχολή, ΕΚΠΑ

⁴Καθηγήτρια, Τμήμα Νοσηλευτικής, Πανεπιστήμιο Δυτικής Αττικής

⁵Επίκουρος Καθηγητής, Τμήμα Νοσηλευτικής, Πανεπιστήμιο Πελοποννήσου

⁶Επίκουρη Καθηγήτρια, Τμήμα Νοσηλευτικής, Πανεπιστήμιο Δυτικής Αττικής

⁷Καθηγήτρια, Τμήμα Νοσηλευτικής, Πανεπιστήμιο Δυτικής Αττικής

Εισαγωγή: Η ποιότητα ζωής αποτελεί μια υποκειμενική αξιολόγηση της σωματικής, ψυχολογικής και κοινωνικής ευεξίας και αντανακλά τις αντιλήψεις των ασθενών σχετικά με τον αντίκτυπο της διάγνωσης και θεραπείας του καρκίνου του μαστού στην καθημερινή ζωή. Η καλύτερη ποιότητα ζωής σχετίζεται με μεγαλύτερη επιβίωση ασθενών με διάφορους τύπους καρκίνου.

Σκοπός αυτής της μελέτης ήταν η αξιολόγηση της ποιότητας ζωής των γυναικών με καρκίνο του μαστού κατά τη διάγνωση, πριν από τη μαστεκτομή και έξι μήνες μετά τη μαστεκτομή.

Υλικό και Μέθοδος: Το δείγμα της μελέτης αποτέλεσαν 250 γυναίκες με καρκίνο του μαστού που υποβλήθηκαν σε μαστεκτομή και προσέρχονταν για επανεκτίμηση σε τρία νοσοκομεία του νομού Αττικής. Τα δεδομένα συλλέχθηκαν με τη συμπλήρωση της κλίμακας SF-36 Health Survey, στην οποία συμπεριελήφθησαν τα χαρακτηριστικά των ασθενών. Το επίπεδο στατιστικής σημαντικότητας ήταν $p < 0,05$.

Αποτελέσματα: Από το δείγμα που μελετήθηκε, το 39.2% ήταν ηλικίας μικρότερης των 50 ετών, το 38.8% ήταν 51-61 ετών και το 22% ήταν ≥ 66 ετών. Εκτός από τη μαστεκτομή, το 69.6% υποβλήθηκε σε επικουρική ακτινοθεραπεία, το 85.6% χημειοθεραπεία και το 72.8% σε ορμονοθεραπεία. Όσον αφορά στο στάδιο της νόσου, το 5.2% ήταν σταδίου I, το 73.2% σταδίου II και το 21.6% σταδίου III. Έξι μήνες μετά τη μαστεκτομή, οι συμμετέχοντες αξιολογούσαν περισσότερο αρνητικά όλες τις διαστάσεις της κλίμακας SF-36 με στατιστικά σημαντική διαφορά ($p < 0,05$), εκτός από τη διάσταση ψυχικής υγείας ($p = 0,679$). Η διάσταση της σωματικής λειτουργικότητας αξιολογήθηκε περισσότερο αρνητικά από τις γυναίκες μεγαλύτερης ηλικίας ($p < 0,001$), εκείνες της πρωτοβάθμιας εκπαίδευσης ($p < 0,001$), τις άνεργες ($p = 0,001$), όσες ζούσαν στην περιφέρεια Αττικής ($p = 0,004$), όσες ήταν σταδίου II και III ($p = 0,008$) και όσες δεν έλαβαν επικουρική θεραπεία ($p = 0,008$). Η διάσταση του σωματικού ρόλου αξιολογήθηκε περισσότερο αρνητικά από τις γυναίκες ηλικίας άνω των 66 ετών ($p = 0,041$) και όσες ήταν πρωτοβάθμιας εκπαίδευσης ($p = 0,036$). Η διάσταση του σωματικού πόνου αξιολογήθηκε περισσότερο αρνητικά από τις γυναίκες πρωτοβάθμιας εκπαίδευσης ($p = 0,001$), τις άνεργες ($p = 0,032$) και εκείνες που ανήκαν στο στάδιο III ($p = 0,047$). Η διάσταση της γενικής υγείας αξιολογήθηκε περισσότερο αρνητικά από τις γυναίκες που υποβλήθηκαν επιπλέον σε χημειοθεραπεία και ακτινοβολία ($p < 0,001$) και εκείνες που ήταν ελάχιστα ή καθόλου ενημερωμένες για την ασθένειά τους ($p = 0,012$) και τη θεραπεία ($p = 0,003$). Η διάσταση της κοινωνικής λειτουργικότητας αξιολογήθηκε περισσότερο αρνητικά από τις γυναίκες της πρωτοβάθμιας εκπαίδευσης ($p = 0,003$) και εκείνες που ζούσαν σε μικρή πόλη ή χωριό ($p < 0,001$). Η διάσταση του συναισθηματικού ρόλου από τις γυναίκες πρωτοβάθμιας εκπαίδευσης ($p = 0,011$) και εκείνες που ζούσαν σε μια μικρή πόλη ή χωριό ($p = 0,018$). Τέλος, η αλλαγή στην υγεία αξιολογήθηκε περισσότερο αρνητικά από τις άγαμες/ διαζευγμένες/εν χηρεία γυναίκες ($p = 0,040$).

Συμπέρασμα: Η ποιότητα ζωής έξι μήνες μετά τη μαστεκτομή αξιολογείται αρνητικά σε όλες τις διαστάσεις της κλίμακας SF-36, εκτός από τη διάσταση της ψυχικής υγείας. Κοινωνικοί, δημογραφικοί και κλινικοί παράγοντες συσχετίστηκαν με την ποιότητα ζωής έξι μήνες μετά τη μαστεκτομή. Η καλύτερη κατανόηση αυτών των παραγόντων και η συνολική αντίληψη για την ποιότητα ζωής αναμένεται να συμβάλει στον σχεδιασμό ορθολογικών και οικονομικά αποδοτικών παρεμβάσεων για αυτόν τον ευάλωτο γυναικείο πληθυσμό.

Λέξεις-κλειδιά: Καρκίνος του μαστού, Γυναίκα, Ποιότητα ζωής

✉ **Corresponding Author:** Καράογλου Μαρία, Ελευθερίου Βενιζέλου 112B, TK 19200 Ελευσίνα, e-mail:karaogloumary@gmail.com

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