



Original Article

Perspectives on Quality of Life in Women with Breast Cancer

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ABSTRACT

Objectives: The objectives of the study are to assess changes in the quality of life amongst breast cancer patients undergoing treatment at a cancer institute in Colombia.

Materials and Methods: Analytical observational prospective cohort study in patients over 18 years of age diagnosed with breast cancer. Health-related quality of life (HRQoL) was analysed using the EQ-5D-3L questionnaire and a Visual Analogue Scale measured at diagnosis and after a 6-month follow-up. Sociodemographic and clinical factors were analysed using a logistic regression model, with STATA 16 software.

Results: A total of 103 patients met the included criteria and were included in the study, with a median age of 56 years. According to the Tumour, Node, Metastasis classification of cancer stage, the majority of participants (35.92%) were in stage 2 of cancer. Multivariate analysis revealed that changes in HRQoL were significantly associated with age (odds ratio [OR] = 1.06, $P = 0.001$), radiotherapy (OR = 3.56, $P = 0.038$) and moderate anxiety and depression (OR = 5.54, $P = 0.007$).

Conclusion: While the overall quality of life in women with breast cancer showed a slight improvement over the 6 months, older patients and those receiving radiotherapy experienced a greater decline in health perception.

Keywords: Breast neoplasms, Quality of life, Health care, Cancer

INTRODUCTION

The global burden of cancer remains significant in low- and middle-income countries, which accounted for 70% of the nearly 10 million cancer-related deaths in 2020.^[1] Within this context, breast cancer stands out as a major public health concern, with approximately 7,790,717 cases reported worldwide, making it the most prevalent form of cancer. It is also the leading cause of cancer-related death in women globally, with an incidence of 6.9%.^[2]

In the Americas, statistics show that around 460,000 women are diagnosed with breast cancer annually, with approximately 100,000 deaths recorded each year. The Pan American Health Organization recognises breast cancer as the second leading cause of mortality amongst women in the region.^[3] This scenario not only reflects a significant burden in terms of mortality but also has a direct impact on the health-related quality of life (HRQoL) of women facing this disease.^[4]

HRQoL, defined as the subjective perception of well-being and satisfaction in daily life, is affected by various factors in the context of breast cancer.^[5,6] Amongst the variables considered are physical and mental health, educational level, marital status, income, employment status, support networks and the environment in which they live.^[6,7] In terms of physical well-being, the disease can manifest itself through symptoms and restrictions that impact the ability to carry out daily life activities such as walking, eating or resting.^[8] In addition, invasive or prolonged medical treatments can generate pain, discomfort and side effects, which affect patients' quality of life. In the area of mental health, breast cancer not only represents a physical challenge but can also give rise to stress, anxiety, depression and other emotional disorders.^[9] It is in this context that it becomes essential to understand and assess the quality of life of breast cancer patients.^[5-9]

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The EQ-5D (EQ-5D-3L) is a generic instrument for measuring quality of life, developed by the EuroQol Group in 1990. This approach encompasses both qualitative and quantitative aspects, allowing the collection of valuable information through five dimensions and a Visual Analogue Scale (VAS). The VAS captures patients' self-reported perception of health on a scale from 0 (worst health status) to 100 (best health status),^[10,11] providing a comprehensive tool for analysing the impact of events on quality of life. Thus, the need arises to evaluate changes in the quality of life of breast cancer patients undergoing treatment at a cancer institute in Colombia.

MATERIALS AND METHODS

An analytical, observational, prospective cohort study was conducted in a high-complexity institution, focusing on adult patients over 18 years of age with a diagnosis of breast cancer. The assessment of quality of life was carried out using the EQ-5D-3L scale, 'EuroQol 5D', at two different time points: During the initial consultation with oncology and after 6 months. The scale, which covers five dimensions (mobility, self-care, daily activities, pain and discomfort and depression and anxiety), presents three response options for each dimension (1: No problem, 2: Moderate problem and 3: Severe problem).

The variables considered in this research included age, sex, marital status, educational level, place of residence, stage of the disease, surgical intervention, chemotherapy, and radiotherapy, amongst others. For the description of continuous variables, measures of central tendency and dispersion were used, while categorical variables were presented with absolute frequencies and percentages.

The analysis of quality of life was structured in three sections. First, the results of the VAS scale at the initial consultation and at 6 months were evaluated using Pearson's correlation (CP), analysing each variable of interest in relation to the VAS results and determining the direction and magnitude of the association. Second, the changes in the dimensions were analysed in two categories as follows: a participant was defined as maintaining their quality of life if there was no change in the condition of having no problems (1-1), moderate problems (2-2) or severe problems (3-3). In terms of improvement in quality of life, a participant was considered to have experienced improvement if they went from having moderate problems to having no problems, from having severe problems to having moderate problems (3-2) and from having severe problems to having no problems (3-1). Conversely, a participant was defined as having experienced a deterioration in their quality of life if they went from having no problems to moderate problems (1-2), from moderate to severe (2-3) and from no problems to severe (1-3). The McNemar's test was performed to identify statistically significant differences ($P < 0.005$) between these changes.

Finally, profiles were constructed for each patient based on the answers for each dimension, i.e., if a patient answered that they had no problem in the five dimensions, a profile of 1-1-1-1-1 was established; on the other hand, if they had answered that they had a moderate problem in the self-care dimension, the profile would be 1-2-1-1-1. Thus, the profile showing the worst health status would be 3-3-3-3-3-3. A comparison was made between the baseline profiles and the 6th month of follow-up. Likewise, for the analysis of these changes, McNemar's test was applied to establish whether they were statistically significant. Finally, a model was constructed using logistic regression. The analyses were carried out in the STATA 16 software (College Station, Texas, USA).

The completion of this work was in accordance with the guiding principles of current clinical research, and prior approval was obtained from the institution's ethics committee. The guidelines established in Resolution 008430 of 1993 from the Ministry of Health of Colombia and the Helsinki Declaration, established in 1964 and updated in its latest revision in October 2013, were followed. The recommendations of the Good Clinical Practice Guidelines in clinical research and the basic ethical principles inherent in this type of research design, including respect for individuals, beneficence, and justice from the Belmont Report, were applied.

RESULTS

A total of 103 participants were included in the study and met the inclusion criteria; all were women, with a median age of 56 years (interquartile range 47–65), and the main level of schooling was elementary school, with 52.43%. Likewise, in the Tumour, Node, and Metastasis classification of the cancer stage, it was observed that most of the participants were in stages 2 and 3 (35.92% and 34.95%, respectively); regarding treatments, most of the participants had undergone a mastectomy (64.08%) and had received chemotherapy (89.32%) during the months of follow-up [Table 1].

Visual Analogue Scale (VAS)

A comparative analysis was carried out between baseline VAS and the 6th month of follow-up. The median VAS was 79 (63–90), and at 6 months, it was 80 (70–90). A moderate positive correlation was observed in patients under 50 years of age (CP = 0.564). In the 50–69 years group, the correlation was positive but weak (CP = 0.212). For those older than 70 years, a moderate negative correlation was evident (CP = -0.435), suggesting an inverse relationship between age and improvement in VAS at 6 months. Participants with elementary and high school education experienced a weak and positive correlation (CP = 0.223) (CP = 0.258). Those with bachelor's education showed a moderate and positive correlation (CP = 0.43), while those with technical/associate education showed a very weak and positive correlation (CP = 0.154).

Table 1: Demographic and clinical factors in the quality of life of women with breast cancer.

Variable	Category	n	%	VAS Baseline	VAS 6 months	Pearson correlation	P-value
				Median - IQR	Median - RI		
Age	<50	32	31.07	75.5 (61.5–90.5)	90 (80–95)	0.5643	<0.001
	50–69	56	54.37	80 (70–90)	80 (70–90)	0.2124	0.116
	≥70	15	14.56	70 (60–80)	71 (60–80)	–0.4352	0.105
Educational level	Elementary	54	52.43	75.5 (64–80)	80 (70–90)	0.2237	0.104
	Early childhood	2	1.94	47.5 (45–50)	80 (80–80)	N/A	N/A
	High	33	32.04	80 (63–95)	80 (70–95)	0.2585	0.146
	Bachelor	7	6.8	85 (75–96)	90 (70–100)	0.4307	0.335
	Technician/associate	5	4.85	90 (70–100)	95 (70–100)	0.1549	0.804
	No data	2	1.94	83.5 (77–90)	90 (80–100)	1	<0.001
Stage	0	4	3.88	81 (77.5–91)	85 (80–92.5)	0.5889	0.414
	1	13	12.62	80 (70–85)	80 (70–95)	0.1208	0.694
	2	37	35.92	70 (61–80)	80 (70–90)	0.281	0.092
	3	36	34.95	80 (70.5–90)	80 (70–90)	0.3893	0.019
	4	13	12.62	83 (61–95)	80 (80–95)	0.1454	0.635
Mastectomy	No	37	35.92	75 (61–82)	80 (70–90)	0.1895	0.261
	Yes	66	64.08	80 (69–90)	80 (70–95)	0.3369	0.005
Chemotherapy	No	11	10.68	75 (66–100)	80 (60–90)	–0.0019	0.996
	Yes	92	89.32	79.5 (62.5–88.5)	80 (70–92.5)	0.2984	0.003
Radiotherapy	No	65	63.11	77 (62–88)	80 (70–95)	0.237	0.057
	Yes	38	36.89	80 (70–90)	80 (70–90)	0.3314	0.042
Other breast procedures	No	78	75.73	80 (63–90)	80 (70–90)	0.2442	0.031
	Yes	25	24.27	75 (66–80)	80 (70–90)	0.3334	0.103

IQR: Interquartile range, VAS: Visual analogue scale, Variables that improved are indicated in green, and those that worsened are in pink

Table 2: Changes in quality of life by dimensions: Comparative results between the baseline and 6-month periods.

Basal versus 6M	Mobility		Personal care		Usual activities		Pain/discomfort		Anxiety/depression	
	n	%	n	%	n	%	n	%	n	%
No changes										
1–1	88	85.44	92	89.32	71	68.93	37	35.92	44	42.72
2–2	-	-	-	-	4	3.88	14	13.59	11	10.68
3–3	-	-	-	-	-	-	-	-	-	-
Subtotal	88	85.44	92	89.32	75	72.82	51	49.51	55	53.4
Improved										
2–1	6	5.83	3	2.91	9	8.74	15	14.56	13	12.62
3–2	-	-	-	-	-	-	3	2.91	1	0.97
3–1	1	0.97	-	-	-	-	3	2.91	2	1.94
Subtotal	7	6.8	3	2.91	9	8.74	21	20.39	16	15.53
Worsened										
1–2	8	7.77	8	7.77	15	14.56	24	23.3	25	24.27
2–3	-	-	-	-	-	-	2	1.94	1	0.97
1–3	-	-	-	-	4	3.88	5	4.85	6	5.83
Subtotal	8	7.77	8	7.77	19	18.45	31	30.1	32	31.07
Total	103	100	103	100	103	100	103	100	103	100
P-value	0.729		0.61		0.471		0.902		0.889	

Variables that improved are indicated in green, those that remained unchanged are in yellow, and those that worsened are in pink.

Participants in the *in situ* (0) stage of their disease experienced significant improvements in quality of life and

presented a strong and positive correlation (CP = 0.588). Stage I participants presented a weak and positive correlation

(CP = 0.12); in Stages II and III, both showed moderate and positive correlations (CP = 0.281) (CP = 0.389), respectively. Stage IV patients showed a weak and positive correlation (CP = 0.145). In the case of the participants with mastectomy, the correlation was moderate and positive (CP = 0.336) in contrast to the participants without mastectomy, in whom a weak and positive correlation was observed (CP = 0.189). On the other hand, the correlation was moderate and positive in patients who received chemotherapy (CP = 0.2984), as opposed to those who did not receive this treatment, where the correlation was practically null (CP = -0.0019). In relation to radiotherapy, the correlation with respect to receiving or not receiving this treatment was moderate and positive, with CP = 0.3314 and CP = 0.237, respectively. In addition, in the group of patients who underwent other surgical interventions, the correlation was moderate and positive (CP = 0.3334). Likewise, there is a positive correlation of moderate magnitude (0.2442) between the absence of other breast procedures [Table 1].

Dimensions of EQ-5D

Most participants, 85.44%, maintained a constant quality of life in the mobility dimension between the baseline period and 6 months. Improvement was observed in 6.8%, while 7.77% experienced deterioration in this dimension, with a value ($P = 0.729$). Similarly, in the self-care dimension, most participants, 89.32%, maintained a constant quality of life. On the other hand, an improvement was observed in 2.91%, while 7.77% experienced deterioration in this dimension, with a value of $P = 0.61$. In the usual activities dimension, it is observed that 72.82% of the participants experienced no changes in their quality of life. A total of 8.74% experienced improvements, while 18.45% experienced a deterioration in this dimension, with a value ($P = 0.471$).

Amongst the participants, 49.51% maintained the same condition in the pain and discomfort dimension. Within this group, 35.92% reported no problems, 13.59% experienced moderate problems, and none reported severe problems. In addition, 20.39% of the participants showed improvements in the pain and discomfort dimension. Amongst them, 14.56% improved from moderate to no problems, another 2.91% improved from severe to moderate problems, and another 2.91% improved from severe to no problems, with a value ($P = 0.902$). Conversely, 30.1% of the participants experienced a worsening in the pain and discomfort dimension. Likewise, 23.3% worsened from no problems to moderate problems, 1.94% worsened from moderate to severe problems, and 4.85% worsened from no problems to severe problems with a P -value ($P = 0.902$).

Furthermore, 53.4% of the participants maintained the same condition in the anxiety and depression dimension, 42.72% had no problems, 10.68% presented moderate problems, none reported severe problems, and 15.53% of the participants

experienced improvements in the anxiety and depression dimension. Similarly, 12.62% went from moderate problems to no problems, 0.97% improved from severe to moderate problems, and 1.94% went from severe problems to no problems with a value ($P = 0.902$). 31.07% of the participants experienced a worsening in the dimension of anxiety and depression. Finally, 24.27% went from no problem to moderate problems, 0.97% worsened from moderate to severe problems, and 5.83% went from no problem to severe problems with a value ($P = 0.889$) [Table 2].

Profile analysis by dimensions

A comparative analysis between the baseline profiles and the 6-month profiles was carried out to evaluate possible changes in the distribution of the profiles. The 10 most frequent profiles were analysed and characterised by a specific combination of categories where each position indicates the location of the dimensions: Mobility, self-care, usual activities, pain and discomfort and anxiety and depression. Profile 11111 was the most prevalent both at baseline and at 6 months, accounting for 55.34% and 30.1%, respectively. Other profiles, such as 11121, 11122, 11112, and 11222, also showed a marked presence, although with variations in their proportions between the two periods. Profile 11121 increased from 10.68% at baseline to 14.45% at 6 months, suggesting changes in the pain and discomfort dimension, but no statistically significant differences were observed in the distribution of the profiles between the two measurements ($P = 1.000$) [Table 3].

The multiple logistic regression analysis indicates that for each additional year of age, the likelihood of experiencing negative changes in the Visual Analogue Scale (VAS) increases (OR: 1.06; 95% CI: 1.014–1.115; $P = 0.011$). Individuals who received radiotherapy are 3.56 times more likely (95% CI: 1.072–11.840; $P = 0.038$) to exhibit negative changes in the

Table 3: Comparison of the top 10 profiles between the baseline period and 6 months: Distribution and statistical significance.

Profiles	Baseline versus month 6 profiles		
	n (%)	n (%)	P-value
11111	57 (55.34)	31 (30.1)	1.000
11121	11 (10.68)	19 (14.45)	
11122	10 (9.71)	12 (11.65)	
11112	6 (5.83)	13 (12.62)	
11222	4 (3.88)	4 (3.88)	
11133	2 (1.94)	2 (1.94)	
11221	2 (1.94)	2 (1.94)	
11113	1 (0.97)	1 (0.97)	
11131	1 (0.97)	0	
11132	1 (0.97)	1 (0.97)	
Otros	8 (8)	18 (17)	
Total	103	103	

Table 4: Factors associated with negative changes in VAS in patients with breast cancer.

Variables	OR	95% CI	P-value
Age	1.06	(1.014–1.115)	0.011
Radiotherapy	3.56	(1.072–11.840)	0.038
Anxiety-depression (6 m)			
Moderate	5.54	(1.609–19.053)	0.007
Severe	2.18	(0.077–61.002)	0.647

OR: Odds ratio, CI: Confidence interval, VAS: Visual analogue scale

VAS compared to those who did not receive it. Furthermore, those with moderate anxiety-depression at the six-month follow-up have 5.54 times greater odds (95% CI: 1.609–19.053; $P = 0.007$) of experiencing negative changes in the VAS compared to those without anxiety-depression [Table 4].

DISCUSSION

Quality of life in cancer patients is of vital importance, given the changes that occur after the diagnosis and management of the disease. In breast cancer, numerous investigations have been carried out to determine the impact of the disease on HRQoL.^[12] Amongst the most commonly used instruments is the EQ-5D scale, as well as specific scales such as the functional assessment of cancer therapy-breast cancer.^[13] The EQ-5D is one of the most recommended scales for measuring the generic quality of life of patients, given its content validity, construct and reliability.^[14]

Amongst the results found in this cohort, it is worth noting that the 50–69 age groups are the most frequent age of diagnosis amongst the selected patients, in agreement with the literature.^[15] However, it is noteworthy that a significant number of patients outside these ages constitute a major issue since they are outside the screening ranges, which may impact their timely diagnosis. These findings are consistent with the results found in other studies, in which the mean age of patients is <50 years, with 49.8 years and 46.9 years in the Indian population^[16,17] and 25% under 50 years of age in the results of a quality-of-life study in Brazil.^[18]

Likewise, among the results found, there was evidence of a low level of schooling, with elementary schooling being the predominant educational level amongst the patients, in agreement with what was reported by other authors, such as Wadasadawala *et al.*, who identified that 36.7% of the patients had no education;^[17] in this sense, they also showed lower scores in the quality of life of people with a lower educational level. Similarly, in another study, the population with cancer had a lower educational level compared to the general population.^[16] Regarding the stages of the patients, in our population, the majority of patients are between stage II and III, in agreement with what is reported in the literature, where stage III predominates amongst patients with breast cancer.^[16,17]

In the analysis by dimensions, the most affected dimensions during follow-up were pain and discomfort and anxiety and depression, in agreement with what is reported in the literature, which shows that these dimensions are more affected after different interventions such as surgery, chemotherapy and/or radiotherapy.^[16,19] This may be caused by the impact generated after the diagnosis of breast cancer, as well as the requirement of invasive treatments, amongst which mastectomy stands out. Likewise, the self-care dimension was the one that presented the lowest degree of affection, in agreement with some studies.^[16] By contrast, some authors report greater affection for these dimensions at the initial moment and improvement with respect to the progress of the treatment and worsening of mobility, usual activities and self-care.^[18]

Regarding VAS, the results are similar to those reported in our study in the baseline measurement, with improvement after the procedures were performed,^[17] and differ from those reported in other studies, which show higher scores in the baseline scale with respect to the measurement during the completion of treatment and follow-up.^[17] Thus, the correlation between the degree of severity in the staging of patients with lower VAS scores was not evident in this study. On the other hand, our chemotherapy patients had higher VAS scores than patients in other studies.^[17] The most commonly used therapy in breast cancer is chemotherapy, followed by surgery, endocrine therapy and, to a lesser extent, radiotherapy.^[18] The association between treatments and VAS has been described previously, indicating the complexity of treatment decision-making and its impact on quality of life.^[20] Consequently, individuals with a bachelor's educational level tend to experience substantial improvements in quality of life as measured by VAS, while individuals with technician/associate schooling showed a very weak and positive correlation ($CP = 0.154$), indicating that this group experiences minimal improvements in quality of life.

Multivariate analysis highlights the significant influence of age, radiation therapy and the presence of moderate anxiety depression in predicting negative changes in VAS. The findings underscore the importance of considering these factors when addressing quality of life in women with breast cancer and the need to individualise care to manage the unique needs of each patient.

One of the limitations of this study is that the measurements were conducted during a fixed period for all patients, regardless of their treatment phase or cycle, which could influence their perception of quality of life. Patients' perceptions may vary depending on the stage of their disease. However, the results observed are consistent with those reported in the literature. In addition, future studies could focus on evaluating the quality of life of caregivers of breast cancer patients, for whom the EQ-5D has been shown to be an adequate tool for measuring quality of life.^[21]

CONCLUSION

The quality of life in women with breast cancer showed a slight overall improvement. However, older patients and those who received radiotherapy experienced a greater deterioration in their health perception. The education level and cancer stage also affect quality of life, emphasising the need for targeted interventions focusing on these associated factors.

Ethical approval

The Institutional Ethics Committee approved this research on 15 January 2024, with reference number CEI-2024-07461-1.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent.

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Nil.

Conflicts of interest

There are no conflicts of interest.

Use of artificial intelligence (AI)-assisted technology for manuscript preparation

The authors confirm that there was no use of artificial intelligence (AI)-assisted technology for assisting in the writing or editing of the manuscript and no images were manipulated using AI.

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