Holistic Pre- and Post-Operative Evaluation of Dependence Score and Quality of Life in Patients with Breast Cancer

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Abstract

Aim: The aim of this study was to monitor the evolution of pain, dependence score and quality of life in the pre- and post-operative period, in association with surgery type and specific healthcare problems. *Material and Method:* We conducted a prospective, descriptive study. Patients were evaluated using scales using a holistic approach, both preoperatively and postoperatively, to assess pain, quality of life, and dependence score. *Results:* The score for pain, dependence score and quality of life in the postoperative period, in patients with mastectomy, is higher than in patients who underwent conservative surgery. The complexity of care problems increases in direct proportion to the extent of surgery and pre-existing comorbidities. *Conclusions:* The increase in the quality of life assessment score is directly correlated with the increase in the dependency score calculated by using the Scale / degree of dependence assessment scale on the 14 Fundamental Needs, both values increased, being directly related to the decrease in quality of life in the postoperative period.

Keywords: Breast cancer; Quality of Life (QoL); Preoperatively; Postoperatively; Dependence score

Introduction

The holistic approach of the breast cancer patient provides an overview of personal holistic needs in the surgical stage of breast cancer treatment. The conceptual model of Virginia Henderson is based on a holistic approach, considering the identification of care problems on the 14 fundamental needs and providing the necessary care for the patient to regain independence [1]. The holistic approach of breast cancer patients operated allows the identification of care problems on the 14 basic needs [2,3]. Increased preoperative anxiety negatively influences pain in the postoperative period, and preoperative use of opioids. The anxiety is associated with increased postoperative morbidity, infections, respiratory and heart failure. Doan and Blitz highlighted the importance of preoperative evaluation and management of patients with pain and anxiety [4].

Pain scores are higher in mastectomy patients with axillary lymphadenectomy. It is very important to manage pain in its acute period, immediately postoperative, to prevent the installation of chronic post mastectomy pain, which negatively affects the quality of life, in the long term [5]. The extent of surgery, mastectomy, axillary lymphadenectomy, influences these scores and increases the need for care, which is also recorded in previously reported studies [6-8].

Immediately ***postoperative***, in the first days, the score of dependence in the patient with mastectomy and axillary lymphadenectomy is high. the patient passes in the postoperative period from the

second degree of dependence, followed by the third degree of dependence, having a higher care requirement than the patient who practiced conservative surgery.

The role of the nurse in the care of the breast cancer patient is to act for the patient when she lacks the necessary knowledge, physical strength or will to act. This role is complex and creative, providing unlimited opportunities for the nurse to apply the acquired knowledge and skills. Care problems in patients with breast cancer in the preoperative period differ from those in the postoperative period but influence them. The complexity of care problems increases in direct proportion to the extent of surgery and pre-existing comorbidities.

The main objective of this study was to track the evolution of pain, dependancy score and quality of life, in the preoperative and postoperative period, but also the evaluate the influences on these scores by the type of surgery and to identify specific care problems.

Material and Method

Design and Settings

We conducted a prospective, descriptive study on patients with breast cancer regardless of surgery type (diagnostic or therapeutic surgery), hospitalized and treated between 01/01/2018 and 31/12/2020, at the level of Surgery II Clinic, Emergency County Clinical Hospital, Oradea.

The criteria for inclusion in the study are represented by: 1) Female gender, 2) Age: 18-79 years, 3) Patients with histopathologically confirmed breast cancer, 4) Patients with breast cancer who have undergone surgery (diagnostic, and / or curative, conservative and / or radical and / or palliative surgery), 5) Patients with breast cancer with or without comorbidities.

The exclusion criteria consisted of: 1) Age > 79 years or <18 years, 2) Patients with benign breast tumors, 3) Patients with suspected histopathological breast cancer, 4) Patients with breast cancer who have not had surgery, and 5) Patients who disagreed with participation.

Method

We used the VAS (Visual Analog Scale) to assess the pain. At the visual analog scale, the expressiveness of the patient's face is monitored in patients who cannot communicate. At the numerical pain assessment scale, the patient is asked to rate her pain on a scale of 0 to 10 and a score of 0 indicates no pain, while a score of to 10 indicates severe pain. Interpretation of pain scale is as follow: 0 = no pain; 1-3 = mild pain; 4-6 = moderate pain; 7-9 = severe pain; 10 = extreme pain.

The Quality of Life (QoL) scale was used to assess the quality of life. Six domains are evaluated and consist of 6 items, rated from 0 (normal) to 10 (absent). A high score indicates a low quality of life. This assessment scale includes the areas of quality of life concerning health, physical well-being, psycho-emotional, social and independence in carrying out daily activities.

For the holistic assessment of the patient, the 14 Fundamental Needs were assessed, using Scale for assessing the score/degree of dependence. Virginia Henderson's conceptual model considers the patient's approach as a whole. Through the holistic approach of the patient, the problems of care are identified on the 14 Fundamental Needs that interrelate with each other and influence each other [1]. Each need is assessed with a score from 1 to 4, depending on the level of impairment, 1 independent, 2 mild impairment, 3 moderate impairment, 4 severe impairment.

Transforming the dependency score into a degree / level of dependency:

- independent, autonomous person, with a dependency score of 14 points - grade 1
- person with moderate dependence, with a dependency score between 15-28 points - grade 2
- person with major addiction, with a dependency score between 29-42 points - grade 3
- person with total dependence, with a dependency score between 43-56 points - grade 4

The higher the dependency score and the higher the dependency level, the lower the quality of life. The increase in the dependency score is associated with the increase in addiction problems and the need for care. Thes scale includes the four dimensions of quality of life related to health, physical

well-being (circulation, respiration, food mobilization, hygiene), mental well-being (safety, achievement, beliefs, values), independence in daily activity and social relationships. (communication, recreation, socio-professional reintegration) and ensure the evaluation of the quality of life.

The records for each patient were made and the follow-up sheet of the patient with breast cancer was completed, which were entered in electronic format and statistically analyzed. Patients were evaluated by a holistic approach in the pre-operative and post-operative period using scales to assess pain, quality of life and addiction score.

Statistical Methods

Data processing was performed using the SPSS trial version program. Data were reported as arithmetic means and standard deviations for the scales. We tested of statistical significance using Student method (t-test). ANOVA test with Bonferroni correction was used to compare values of the scores between more than two groups. All tests were two-tailed at a significance level of 0.05, so p-values smaller than 0.05 were considered statistically significant.

Results

Seventy-six patients with breast cancer were evaluated, 29 patients who underwent diagnostic surgery and 47 patients who underwent therapeutic surgery (15 patients with conservative surgery and 32 patients with radical surgery).

Pain

Regardless of the type of intervention, the pain score increased significantly post-operative compared to the pre-operative evaluation (Table 1).

Table 1. Pain dinamics according to the type of intervention

Surgery type	Preoperative	Preoperative	p-value
Conservative	2.14±0.71	3.36±1.16	<0.001
Mastectomy	1.93±0.26	4.13±1.06	<0.001
Diagnosis	2.03±0.47	4.91±1.26	<0.001

According to the type of intervention, no significant differences in pain scores during the pre-operative period were identified (p>0.10, Table 2). A significant difference betweensurgery for diagnostic purposes and mastectomy in the post-operative period was observed in our study (3.36 vs. 4.91, p<0.001). Furthermore, also a difference between conservative intervention and mastectomy was observed (Table 2).

Table 2. Statistical significance of pain depending on the type of surgery

	Diagnostic - conservative	Diagnostic - mastectomy	Conservative - mastectomy
Preoperative	0.168	0.475	0.361
Postoperative	0.034	<0.001	0.024

Pain significantly increased post-operative in patiens with and without lymphadenectomy.No significant differences between patients with and without lymphadenectomy was observed preoperative, but the postoperative pain score was significantly higher in patients with lymphadenectomy patients (Table 3).

Table 3. Pain in patients with and withour lymphadenectomy

	Preoperative	Postoperative	p-value

With lymphadenectomy	2.03±0.46	4.88±1.25	<0.001
No lymphadenectomy	2.07±0.60	3.62±1.19	<0.001
p-value	0.731	<0.001	

Quality of Life

After the diagnostic intervention, the QoL scores on each item increased, but the significance threshold was not reached (p>0.05, Table 4). The total QoL score increased postoperative and showed a tendency to statistical significance (0.05 < p-value < 0.10, Table 4). In patients with conservative surgery, different dimensions showed a significant increase in the score (Sleep and Availability for social activities, Table 4) along with the total score (Table 4). Four out of six QoL dimensions showed a significant increase in patients with mastectomy (p-values > 0.003, Table 4).

Table 4. Evolution of the quality of life according to the type of intervention

	Preoperative	Postoperative	p-value
Diagnosis			
Good mood	1.52±1.21	1.90±1.14	0.226
Displacement capacity	0.93±1.25	1.31±1.31	0.265
Work (domestic and outside the home)	1.38±1.66	1.90±1.57	0.227
Human relations	1.48±1.15	1.97±1.21	0.125
Sleep	1.38±1.18	1.76±1.15	0.221
Availability for social activities	1.86±1.55	2.55±1.35	0.077
Total	8.55±6.34	11.52±6.39	0.081
Conservative			
Good mood	1.53±0.83	1.80±0.77	0.372
Displacement capacity	0.60±0.83	1.13±1.13	0.151
Work (domestic and outside the home)	1.20±1.57	2.13±1.51	0.107
Human relations	1.47±0.83	2.07±0.88	0.066
Sleep	1.20±0.56	2.13±1.06	0.007
Availability for social activities	1.73±1.39	2.87±1.30	0.029
Total	7.73±5.01	12.13±5.07	0.024
Mastectomy			
Good mood	1.81±1.38	2.31±1.35	0.148
Displacement capacity	1.28±1.63	1.88±1.54	0.139
Work (domestic and outside the home)	1.66±1.73	2.97±1.53	0.002
Human relations	1.41±1.50	2.66±1.47	0.001
Sleep	1.38±0.83	2.88±1.07	<0.001
Availability for social activities	1.75±1.48	3.69±1.82	<0.001
Total	9.31±8.04	16.38±6.88	<0.001

No significant differences between the three batches in terms of QoL preoperatively (p>0.05). In contrast, postoperative, a tendency to statistical significance was observed between diagnostic and conservative interventions (p-value<0.010), Table 5, but with statistical significant differences between interventions diagnostic and mastectomy, and conservative intervention vs. mastectomy (Table 5).

Table 5. Statistical significance -quality of life depending on the surgery

	Diagnostic - conservative	Diagnostic - mastectomy	Conservative - mastectomy
Preoperative			
Good mood	0.743	0.377	0.395
Displacement capacity	0.644	0.348	0.064
Work (domestic and outside the home)	0.629	0.526	0.376
Human relations	0.754	0.823	0.860
Sleep	0.290	0.987	0.402
Availability for social activities	0.459	0.775	0.970
Total	0.665	0.695	0.426
Postoperative			
Good mood	0.607	0.199	0.108
Displacement capacity	0.385	0.128	0.071
Work (domestic and outside the home)	0.218	0.009	0.089
Human relations	0.122	0.049	0.096
Sleep	0.019	<0.001	0.034
Availability for social activities	0.050	0.007	0.086
Total	0.060	0.004	0.023

In lymphadenectomy patients, mean QoL scores on each item increased significantly compared to the preoperative assessment ($p<0.05$, Table 6). In terms of the total QoL score, it increased significantly postoperatively (p-value<0.01).

Table 6. Evolution of quality of life in patients with and without lymphadenectomy

	Preoperative	Postoperative	p-value
With lymphadenectomy			
Good mood	1.76±1.35	2.15±1.26	0.231
Displacement capacity	1.21±1.61	1.79±1.51	0.125
Work (domestic and outside the home)	1.68±1.15	2.85±1.52	0.006
Human relations	1.44±1.52	2.59±1.46	0.002
Sleep	1.29±0.80	2.85±1.08	<0.001
Availability for social activities	1.82±1.62	3.59±1.81	<0.001
Total	9.21±8.13	15.82±6.77	0.001
Without lymphadenectomy			
Good mood	1.55±1.11	1.98±1.14	0.084
Displacement capacity	0.86±1.14	1.29±1.20	0.108
Work (domestic and outside the home)	1.29±1.08	2.02±1.37	0.031
Human relations	1.45±0.99	2.02±1.12	0.015
Sleep	1.38±1.03	1.86±1.12	0.046
Availability for social activities	1.76±1.36	2.43±1.19	0.002
Total	8.29±5.68	11.86±5.98	0.006

From the quality of life point of view, comparing the two batches (with and without lymphadenectomy), it was found no significant differences preoperatively, both on items ($p>0.05$) and on the total score (Table 7). Postoperative, it was found that there are significant differences between the total quality of life scores (15.82 vs. 11.86, p-value$=0.009$, Table 7).

Dependency Score

After the diagnostic intervention, postoperative score values increased significantly compared to the preoperative evaluation in 6 items: "move, posture" (p-value<0.001), "sleep, rest" (p-value $=0.001$), "dress, undress" (p-value $=0.006$), "integuments and mucous membranes" (p-value $=0.011$), "avoid dangers" (p-value <0.001), "perform" (p-value$=0.030$). The total score for addiction increased significantly compared to the preoperative evaluation regardless the type of intervention (Table 8).

Table 7. Quality of life items: differences between patients with and without lymphadenectomy

	Preoperative	Postoperative
Good mood	0.454	0.541
Displacement capacity	0.291	0.123
Work (domestic and outside the home)	0.323	0.023
Human relations	0.971	0.068
Sleep	0.681	<0.001
Availability for social activities	0.860	0.020
Total	0.579	0.009

Table 8. Evolution of the dependance score according to the type of intervention

	Preoperative	Postoperative	p-value
Diagnosis			
Total	18.59±3.57	22.24±3.39	<0.001
Conservative			
Total	17.40±3.22	22.60±3.16	<0.001
Mastectomy			
Total	18.94±3.87	24.72±4.14	<0.001

After a conservative intervention, the dependence score also increased significantly compared to the preoperative evaluation (Table 8).

After mastectomy the scores increased significantly compared to the preoperative evaluation in 9 needs: "breathe, circulation"(p-value=0.002), "remove" (p-value=0.034), "move, posture" (p-value<0.001), "sleep, rest" (p-value<0.001), "dress, undress" (p-value<0.001), "integument and mucous membranes" (p-value<0.001), "avoid hazards" (p-value<0.001), "communicate" (p-value =0.031), "perform" (p-value =0.019). The total score for addiction increased significantly compared to the preoperative assessment (Table 8).

Comparing the three groups in the postoperative period, no significant differences were found in the total scores of dependence between the group with diagnostic and conservative intervention, there are differences between conservative intervention and mastectomy (22.60 vs 24.72, p-value=0.086) and there is significant difference between diagnostic intervention and mastectomy (22.24 vs. 24.72, p-value=0.013).

In the lymphadenectomy group, the dependence score increased significantly compared to the preoperative evaluation (Table 10). The total dependence score also increased significantly compared to the preoperative assessment in patients without lymphadenectomy (Table 10).

Comparing the two batches in terms of preoperative dependence level, it was found that there are no significant differences between the total dependence scores. In contrast, in the postoperative period there are significant differences between the scores of dependence (24.65 vs. 22.31, p=0.009).

Table 9. Statistical significance - Dependance score on the 14 Fundamental Needs, depending on the type of surgery

	Diagnostic-conservative	Diagnostic - mastectomy	Conservative - mastectomy
Preoperative			
Breathing, circulation	0.449	0.843	0.402
Drink, eat	0.679	0.573	0.958
A delete	0.449	0.884	0.556
To move, posture	0.540	0.507	0.274
Sleep, rest	0.793	0.564	0.875
Dress, undress	0.103	0.943	0.195
Temperature	0.987	0.977	0.952
Integuments and mucous membranes	0.540	0.864	0.694
Avoid dangers	0.582	0.966	0.600
To communicate	0.624	0.317	0.741
Beliefs, values, religion	0.537	0.921	0.428
A is performed	0.098	0.525	0.014
A is recreated	0.191	0.972	0.189
Preserve health	0.055	0.728	0.017
Total	0.274	0.714	0.189
Postoperative			
Breathing, circulation	0.258	0.032	0.016
Drink, eat	0.967	0.884	0.938
A delete	0.381	0.297	0.129
To move, posture	0.385	0.048	0.015
Sleep, rest	0.566	0.004	0.110
Dress, undress	0.238	0.001	0.043
Temperature	0.978	0.728	0.763
Integuments and mucous membranes	0.777	<0.001	0.001
Avoid dangers	0.105	0.062	0.717
To communicate	0.238	0.043	0.606
Beliefs, values, religion	0.501	0.502	0.914
A is performed	0.723	0.708	0.958
A is recreated	0.978	0.728	0.763
Preserve health	0.642	0.606	0.699
Total	0.730	0.013	0.086

Table 10. Progression of addiction score in lymphadenectomy patients

	Preoperative	Postoperative	p-value
With lymphadenectomy			
Total	18.65±3.86	24.65±4.11	<0.001
Without lymphadenectomy			
Total	18.38±3.48	22.31±3.26	<0.001

Discussion

In the postoperative period, compared to the preoperative period, an increase in the pain score is observed regardless the type of intervention, with good control in our group, with a progressive decrease in pain intensity until the time of discharge,. Preoperative preparation and reducing the anxiety of patients related to anesthesia and surgery is critical.

Regardless of the type of intervention, the pain score increased significantly postoperative compared to the preoperative assessment (p<0.001). Postoperative, the highest pain score was recorded in patients with mastectomy, significantly higher than in those with diagnostic or

conservative intervention. In those with lymphadenectomy, postoperative pain was significantly higher than preoperative .

In patients with conservative surgery and in those with mastectomy, the score for quality of life increased significantly in the postoperative period, associated with decreased quality of life, the score was significantly higher in the case of mastectomy than in the diagnostic or conservative intervention. In patients with and without lymphadenectomy, the mean values of quality of life scores increased significantly in the postoperative period.

Postoperative total dependence score increased significantly compared to preoperative evaluation both after diagnostic intervention (18.59 vs. 22.24, p<0.001), as well as after the conservative one (17.40 vs. 22.60, p<0.001) and mastectomy (18.94 vs. 24.72, p<0.001).

In both the lymphadenectomy and non-lymphadenectomy groups, postoperative dependence score values increased significantly compared to the preoperative evaluation, it was found that preoperatively there are no significant differences between the total addiction scores, in contrast, postoperative there are significant differences (Tables ..).

We considered in the preoperative period the management of the high level of anxiety related to the fear of anesthesia, surgery and insufficient knowledge related to postoperative recovery, by educating patients and favoring a good postoperative evolution. Patients want to know the advantages and disadvantages of a particular surgery, the complications that may occur, data also recorded in the results of a study on the information needs of mastectomy patients [8]. Axillary dissection for breast cancer performs good local control, but short-term and long-term side effects may be significant for the patient, in terms of pain, wound infections, local sensitivity, paresthesia, arm mobility, risk of arm lymphedema, limitation of arm movement, lymphangitis [6,9].

The major complications of axillary lymphadenectomy depend on its scale, the number of lymph nodes removed and have a major impact on daily activities, leading to a decrease in the quality of life, results recorded and a large study on the complications of axillary dissection [10].

The holistic approach of patients allows the assessment of risks related to pain, bleeding, infection, thromboembolic disease, identification of care problems in the postoperative period, and the provision of personalized care [11]. The main objective of the care provided is to recover the functionality of the patient and increase the independence in meeting the fundamental needs.

The scale of evaluation of the score / degree of dependence on the 14 fundamental needs, in the preoperative and postoperative period has specificity for identifying the care problems that occur in the surgical stage of breast cancer treatment and can be used as a tool for assessing the quality of life in the breast cancer patient, allowing the holistic evaluation of the breast cancer patient in the therapeutic surgical sequence, in the complexity of the bio-psycho-social dimensions.Study limitations.

General limitations of the study are related to the fact that inpatients were included in the study at the level of a single surgical ward. Future studies could be used to see if the results are similar in larger batches. Models of psychometric tools, which we have developed for the assessment, monitoring and holistic care of the breast cancer patient, Scale for assessing the score / degree of dependence on the 14 basic needs, Care plan adapted for the breast cancer patient during preoperative and postoperative, could be extended and adapted to patients with other locations of oncological disease, by conducting studies on the dimensions analyzed.

Conclusions

Comparing the three batches in terms of preoperative dependence score, no significant differences between total dependence scores, but postoperative dependence score was significantly higher at mastectomy than diagnostic intervention. Furthermore, postoperative addiction and quality of life scores in mastectomy patients are higher than in patients with conservative surgery.

In the postoperative period an increase in pain score, quality of life, addiction score, care problems is observed in patients with mastectomy and axillary lymphadenectomy and implicitly a decrease in quality of life.

The increase in the quality of life assessment score is directly related with the increase in the dependence score calculated by using the scale of assessment of the score/degree of dependence on the 14 fundamental needs, both increased values, being directly related to the decrease in the quality of life in the postoperative period.

Ethical Issues

The use of the data was made respecting the legislation in force.

Conflict of Interest

The author declare that they have no conflict of interest.

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