Effect of Application Roy's Adaptation Model on Women's Satisfaction and Quality of Life after Mastectomy

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Abstract

Background: Breast cancer is the most common cancer and main cause of cancer death in women and nurses can provide holistic care through application of nursing models. **Aim:** To evaluate the effect of application Roy's adaptation model on women's satisfaction and quality of life after mastectomy. **Design:** A quasi- experimental design was utilized. **Setting:** The study was conducted on the Oncology department at Benha University Hospital and Health Insurance Hospital at Benha city, Egypt. **Sampling:** A Purposive sample included 100 women involving two groups (study and control). **Tools:** Three tools were utilized to collect data and included a structured interviewing questionnaire, Breast-QTM-Mastectomy Module and Roy's Adaptation Model. **Results:** there was a highly significant difference between study and control groups regarding total knowledge, total satisfaction and total quality of life after two weeks of program implementation and after three months of follow up ($P \leq 0.001$).Also, there were high significant differences in all domains of maladaptive behaviors after the program implementation in the study group ($P \leq 0.001$), while it was not significantly different in the control group. **Conclusion:** The application of Roy's adaptation model was effective on improving post mastectomy women's knowledge, satisfaction and quality of life also, promoted women's adaptation to the disease and treatment regimen. **Recommendation:** An educational program should be provided to all nurses on the oncology departments to promote their knowledge to educate women about disease and management.

Key words: Mastectomy, Roy's Adaptation Model, Satisfaction, Quality of Life.

Introduction

Cancer of the breast is a malignant tumor that begins in the cells of the breast and characterized by the uncontrolled growth of abnormal cells in the milk producing glands of the breast or milk ducts ***(American Cancer Society, 2018).***

Breast cancer is among the most common cancers affecting women worldwide and the second most frequent cancer also, the fifth cause of cancer-related mortality among females which affects quality of life worldwide. The prevalence of breast cancer in women ≥15 years in Africa was estimated at 23.5 per 100,000 women and approximately 35,427 women died from the disease (crude mortality rate of 12.8 per 100.000 women) ***(Zakaria et al., 2018).***

Mastectomy is the removal of all breast tissues from a breast to treat or prevent breast cancer. For those with early-stage breast cancer, a mastectomy may be one treatment option. Breast-conserving surgery (lumpectomy), in which only the tumor is removed from the breast, may be another option. Many types of mastectomy are mentioned as subcutaneous mastectomy, a total or simple mastectomy and modified radical mastectomy ***(Mayo Foundation for Medical Education and Research, 2020).***

Chemotherapy is defined as the use of chemical substances for the treatment of cancer by using cytotoxic agents and other drugs and associated with a number of common side effects such as bone marrow suppression, neuropathies, gastrointestinal disorders, hair loss, fatigue and skin disorders ***(American Cancer Society, 2020).***

Hence, breast cancer women need information to understand side effects of chemotherapy so, providing adequate pre-chemotherapy information, including side effects and self-care measures, reduces some treatment-related concerns, physical and psychosocial outcomes. Effective care of chemotherapy-induced side effects is critical for improving women's quality of life, which may influence their willingness to complete treatment ***(Carelle et al., 2017).***

Woman satisfaction is one of the most important outcome measures following breast surgeries as a measurement of quality of care and to understand women's expectations toward

the procedure. As a result, women with breast cancer should be familiar with treatment and cope with side effects of the operation and other therapies ***(Ahmed & Dawood, 2017).***

Quality of life is defined as "the woman's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals". After mastectomy, woman may experience various functional and emotional disorders, such as depression which affect quality of life and leave serious psychosocial consequences ***(Pacaric et al., 2018).***

Roy's Adaptation Model is one of the nursing models that were designed for better understanding of adaptation concept. Based on Roy's Adaptation Model, four dimensions were presented include physiological mode, self-concept mode, role function mode and interdependence mode. According to this model the nurse systematically and carefully surveys the woman through observation and interview then, specifies the maladaptive behavior and subsequently designs the precise educational care plans to address maladaptive behaviors ***(Randhawa & Hasija, 2020).***

The nurse plays an important role in providing care for woman and promoting quality of life and satisfaction. Nursing care is intended to improve women's general health, assist with psychosocial adjustment, and assist women in developing the strength to cope with disease and its consequences ***(Hinkle et al., 2019).***

Significance of the problem

Breast cancer is the most common malignant tumor among females worldwide. Approximately 1.2 million of breast cancer women are diagnosed annually with about 75% of them occurs in women over age 50 years. In Egypt, breast cancer represents about 18.9% of total cancer cases among women with a younger age distribution according to findings from the Egyptian National Cancer Institute ***(Mortada et al., 2018).***

Women's knowledge and decision-making abilities regarding breast cancer treatment in Egypt are limited. So their satisfaction with treatments and adjuvant therapies is also limited. So this study will help mastectomy women to satisfy with health state and have good adaptation through identification of their needs.

Aim of the study

The study aimed to evaluate the effect of application Roy's adaptation model on women's satisfaction and quality of life after mastectomy.

Research objectives:

1- Assessing women's knowledge, satisfaction and quality of life after mastectomy.
2- Designing, implementing and evaluating the effect of application Roy's adaptation model on women's satisfaction and quality of life after mastectomy.

Research hypothesis:

Mastectomy women who will participate in health education program based on Roy's adaptation model will have higher level of knowledge, quality of life and will exhibit better satisfaction & adaptation more than who will not receive the program.

Subjects and Method

Research Design: A quasi -experimental research design (pre/post-test, two groups study and control) was utilized.

Research setting

The study was carried out on the Oncology department at Benha University Hospital and Health Insurance Hospital at Benha city, Egypt. These settings are the main hospitals serving Qalyubia Governorate and the surrounding areas and provide treatment and care for cancer patients.

Sample type and size

A Purposive sample included 100 women representing 10% of the total admission during six months and according to the following criteria: age ≥ 25 years, diagnosed with breast cancer and having unilateral or bilateral mastectomy, undergoing chemotherapy, radiotherapy or other treatment regimen and accepted to participate in the study.

The sample was randomly divided into two groups (study group involved 50 women who received the health education program based on Roy's adaptation model and control group involved 50 women who received knowledge and routine care).

Tools of data collection

Three tools were utilized to collect data:

Tool (I): A structured interviewing questionnaire:

The researchers designed questionnaire based on

literature review **(*El-Sayed N., & Ali Z., 2011) (Soliman et al., 2018)***, and was written in simple clear Arabic language and composed of five parts:

Part I: concerned with the studied women's demographic characteristics such as age, spouse's age, educational level, residence, family size, family income, occupation, length of marriage and menopausal status.

Part II: concerned with obstetrics history of women as length of marriage, menopausal status and use of contraceptive pills.

Part III: composed of woman's medical data of breast cancer such as (history of breast cancer in relatives, site of tumor, presence of metastasis, time between diagnosis of breast cancer and mastectomy, stage of breast cancer at mastectomy, type of surgical intervention, presence of medication after mastectomy).

Part IV: involved knowledge regarding breast cancer and mastectomy and included (9) questions about definition of breast cancer, types, risk factors, signs and symptoms, treatment options, meaning of mastectomy, side effects after mastectomy, predictions after mastectomy and health needs after mastectomy.

Part V: concerned with knowledge regarding chemotherapy and included (5) questions about purpose of chemotherapy, types, risks, precautions and coping with chemotherapy.

Knowledge scoring system

Each complete correct answer was assigned a score (3) and a score (2) was given for incomplete correct answer while, a score (1) was given when the answer was incorrect or I don't know. The total knowledge scores ranged from 14-42 scores and classified as the following:

Adequate knowledge ≥ 60 % (≥ 25 score)
Inadequate knowledge < 60 % (< 25 score)

Tool (II): Breast-QTM-Mastectomy Module: It was adapted from ***(Ahmed & Dawood, 2017)***. This module assesses three domains of quality of life and three domains of satisfaction. The total items of the module included 63 items and given a score based on 3-5 points of likert scale. There are no overall or total points of the Breast QTM Mastectomy Module as each domain has its own score. The questionnaire responses are entered into Q score, then the data was analyzed and converted into a summary score between 0 and 100 with higher scores indicated a better outcome.

The domains of Quality Of Life included:-

1- Psychosocial Well-being: involved (10) items about woman's body image as (confident in a social setting, emotionally healthy, self-confident, and feminine in your clothes….etc.)

2- Physical Well-being: involved (11) items that investigate the following (pain in the muscles of chest, difficulty lifting or moving arms, tightness and nagging feeling in breast area ….etc.).

3- Sexual Well-being: included (6) items that ask about (sexually attractive in clothes, confident sexually, satisfied with sex-life….etc.)

The domains of satisfaction included:-

1- Satisfaction with breasts: included (4) questions about (How you look in the mirror clothed? and unclothed? How comfortably your bras fit? Being able to wear clothing that is more fitted?).

2- Satisfaction with radiated breast(s): consisted of (6) questions as (radiated breast skin looking different, feeling dry, sore, unnaturally thick…..etc.).

3- Satisfaction with surgeon, medical team and office staff: Composed of (26) items that ask about (being professional, reassuring, thorough, give confidence, knowledgeable, made time for concerns …..etc.).

Tool (III): Roy's Adaptation Model: It was adapted from ***(Roy, 2009)*** and consisted of four modes (physiological, self-concept, role function, and interdependence). Each mode composed of questions which are used for interviews, observations, and measurement of maladaptive behaviors of women. The physiological mode comprised some questions regarding oxygenation, nutrition, elimination, activity and rest, protection, senses, fluids and electrolytes, and acid-base balance, neurologic function, and endocrine function. Self-concept mode is composed of items on physical, mental self, and self in relation with others. The role function mode involved items on family, family roles, and family expectations. The interdependence mode included questions regarding woman's social and personal relationships and habits. The answers was measured and given a score based on a five point Likert scale as the following: Never (1), rarely (2), Sometimes (3), Often (4) and Always (5). The total score ranged from 38- 190 with the higher score indicated more adaptive behaviors.

Validity

The present study was submitted to five academic nursing staff in the Obstetrics and Gynecological Health Nursing and Community Health Nursing to test content validity and clarity of sentences and the recommended modifications were performed.

Reliability

The reliability was done by Cronbach's alpha coefficient test. For knowledge of the study group it was 0.980 and for control group it was 0.986. For quality of the study group it was 0.762 and for control group it was 0.715. For satisfaction of the study group it was 0.812 and for control group it

was 0.784. For Roy's adaptation model of the study group it was 0.730 and for control group was 0.761.

Ethical considerations

Women were contacted individually to explain the study's objective, to ensure their best possible cooperation, and to ensure the data's confidentiality. The researchers emphasized to women that participation in the study was voluntary and the questionnaires were anonymous. Also, the women had the full right to refuse to participate in the study or withdraw at any time without giving any reason.

Pilot study

The pilot study was carried out on 10% (n=10) of the studied women to test the study tools for applicability, clarity, time needed to fill in the questionnaires and the research process's feasibility. The necessary modifications were done by removing repeated or unneeded questions. The sample of the women recruited in the pilot study was included in the main study sample.

Field work

First, the researchers obtained a formal approval to conduct the study from the directors of Benha University Hospital and Health Insurance Hospital. Then the researchers visited the previous mentioned study settings 3 days per week from 9 am to 2 pm reciprocally between the two hospitals. Each woman was interviewed individually on average 2-3 women per day. The current study lasted six months from the beginning of September 2019 to the end of February 2020.

For the study group: the health education program based on Roy's adaptation model was implemented through four phases: assessment, planning, implementation and evaluation phases.

A- Assessment phase: through this phase the researchers interviewed women, explained the study purpose and asked them for participation. Then, each woman was interviewed separately to assess demographic characteristics, obstetrics history, medical data and knowledge related to breast cancer, mastectomy and chemotherapy. Also, the researchers used the Breast-QTM Mastectomy Module to assess woman's quality of life and satisfaction after mastectomy. Finally, Roy's adaptation model was utilized to determine the maladaptive behaviors of women. The average time for completion of the interview was around 30-45 minutes for each woman.

B- Planning phase:

The information obtained from the assessment phase and comprehensive review of relevant literatures had constituted the baseline for the development of the health education program based on Roy's adaptation model and the educational booklet that was written in an Arabic language illustrated by figures. Also, sessions' numbers, contents, various teaching methods and the instructional media were determined. Women's telephone number was obtained to facilitate contact with women for follow up.

C- Implementation phase: Implementation of the model was carried out through five sessions, the duration of each session ranged from 30-45 minutes including periods of discussion, PowerPoint presentation and educational videos. After each session, feedback about the previous session was done to ensure understanding and the objectives of the new topics were mentioned.

- **First session**: at the beginning the researchers distributed the educational booklet to women and introduced an orientation about the booklet then provided the women with an overview about anatomy and physiology of the breast after that the researchers provided complete explanation about breast cancer which included definition, types, risk factors, signs and symptoms and treatment options.
- **Second session**: the researchers illustrated the definition of mastectomy, side effects, women's predictions after mastectomy, and health needs, exercise program, daily activities, familiarity with healthy eating habits, and stress.
- **Third session:** the researchers started by a feedback about the previous sessions then explained the purpose of chemotherapy, types, risks, essential precautions that the woman need to consider with chemotherapy and how to cope with chemotherapy.
- **Fourth session:** the researchers provides the woman with instructions that help the woman to accept body image and deal with pain in the muscles of chest and necessary exercise that facilitate lifting and moving arms finally, the researchers instruct the woman how to promote sexual wellbeing.
- **Fifth session:** during this session the researchers illustrates to the woman how to promote satisfaction with her breast, radiated breast, surgeon, medical team and office staff. Also, during this session the maladaptive behaviors that were found from Roy's model preprogram implementation were manipulated and consultation was given and offered recommendation for modification of maladaptive behaviors.

For the control group: only routine care and teaching was given at the unit.

D- Evaluation phase

After implementing the educational program based on Roy's adaptation model, the

post-test was done by using the same format of the pre-test tools. This evaluation was done after two weeks of the model implementation and after 3 months through attendance at the pre mentioned settings or through telephone calls.

Statistical design

All data collected were organized, tabulated and analyzed using appropriate statistical test and by using the SPSS version 20 to calculate frequencies and percentage, mean and standard deviation, as well as tests of significance as Chi-square test (x2)and linear correlation coefficient (r), and matrix correlation to detect the relation between the variables.

Results

Table (1) shows that (48%, 44%) of the control and study groups were in the age group of 45-<55 years with a mean age of 42.97±10.11and42.55±10.05years for both groups respectively. Also, (66%) of the control and (58%) of the study groups lived in urban areas. Concerning educational level (30%) of the control and study groups had secondary education. In addition, (52%, 54%) and (72%, 80%) of the control and study groups had middle level of family income and were house wives respectively.

Table (2) clarifies that (40%) of the control group were married for more than 15years with mean age of 12.85±5.30 years and (38%) of study group had length of marriage about 11-15 years with mean age of 12.59±5.14 years. Regarding menopausal status, about (64%) and (56%) of the control and study groups respectively were Premenopausal. Also, (84%, 74%) of both groups were using contraceptive pills.

Figure (1) illustrates that (76% and 84%) of the control and study groups had history of breast cancer respectively.

Table (3) clarifies that (58% and 66%) of control and study groups had the tumor in the right side and (58% and 52%) reported presence of metastasis respectively. Also, (72% and 78%) and (74% and 86%) of control and study groups had performed modified radical mastectomy and didn't perform breast reconstructive operation respectively.

Table (4) demonstrates that no statistical significant differences was found between control and study groups regarding knowledge pre implementation of the program while, a highly statistical significant differences between both groups was found after two weeks of implementation of the program and at follow up phase ($P \leq 0.001$).

Figure (2) shows that (86% and 84%) of the control and study groups respectively had inadequate knowledge pre implementation of the program while (88% and 74%) of the study group had adequate knowledge two weeks post implementation of the program and at follow up phase respectively.

Table (5) illustrates that no statistical significant differences was found between control and study groups regarding total quality of life level pre implementation of the program while, there was a highly statistical significant differences between both groups after two weeks of program implementation and at follow up phase ($P \leq 0.001$).

Table (6) clarifies that there was no statistical significant differences between control and study groups regarding total satisfaction level pre implementation of the program while, there was a highly statistical significant differences between both groups after two weeks of program implementation and at follow up phase ($P \leq 0.001$).

Table (7) demonstrates that there were high significant differences in all domains of maladaptive behaviors ($P \leq 0.001$) as maladaptive behaviors reduced from 157.52±9.47 to 64.96±5.28 after three months of program implementation in the study group, while it was not significantly different in the control group.

Table (8) illustrates that there was a positive statistical correlation was found in the study group between total knowledge and total quality, total knowledge and total Roy's, total quality and total satisfaction and between total satisfaction and total Roy's preprogram implementation. At follow up phase a positive statistical correlation was found in the study group between total knowledge and total quality, total quality and total Roy's and between total satisfaction and total Roy's.

Table (9) shows that there was a positive statistical significant correlation between total knowledge score and age, education

level , occupation, residence and family income in both groups preprogram implementation, post program except between total knowledge and occupation for the control group and at follow up phase ($P \leq 0.001$) ($P \leq 0.05$).

Table (10) shows that a positive statistical significant correlation was found in the study group between total quality of life and occupation and residence preprogram implementation and between total quality of life and occupation, residence and family income post program. While, a positive statistical significant correlation was found in both groups between total quality of life and age, education, residence and family income at follow up phase ($P \leq 0.001$) ($P \leq 0.05$).

Table (11) illustrates that a positive statistical significant correlation was found in the study group between total satisfaction and education, residence and income preprogram implementation and between total satisfaction and age, residence and income for the control group. While, there was a positive statistical significant correlation in the study group between total satisfaction and age, education, residence and income post program implementation and between total satisfaction and residence at follow up phase ($P \leq 0.001$) ($P \leq 0.05$).

Table (1): Frequency distribution of studied women (control and study groups) regarding their demographic characteristics (n=100).

Items	Control (n=50)		Study (n=50)		X^2	p-value
	No.	%	No.	%		
Age						
25-<35	8	16.0	10	20.0	.777	.855
35-<45	10	20.0	12	24.0		
45-<55	24	48.0	22	44.0		
>55	8	16.0	6	12.0		
Min –Max	25-58		25-58			
Mean ±SD	42.97±10.11		42.55±10.05			
Spouse age						
25-<35	6	12.0	4	8.0	1.554	.670
35-<45	12	24.0	16	32.0		
45-<55	22	44.0	18	36.0		
≥55	10	20.0	12	24.0		
Min –Max	30-63		30-63			
Mean ±SD	48.00±9.96		47.48±9.76			
Residence						
Rural	17	34.0	21	42.0	0.679	.410
Urban	33	66.0	29	58.0		
Educational level						
Illiterate	11	22.0	10	20.0	0.593	.898
Primary	10	20.0	13	26.0		
Secondary	15	30.0	15	30.0		
High education	14	28.0	12	24.0		
Family size						
	7	14.0	10	20.0	5.971	.113
3	12	24.0	16	32.0		
4	18	36.0	20	40.0		
5	13	26.0	4	8.0		
>5						
Family income						
	15	30.0	19	38.0	2.413	.299
Low	26	52.0	27	54.0		
Middle	9	18.0	4	8.0		
High						
Occupation						
House wife	36	72.0	40	80.0	0.877	.349
Employee	14	28.0	10	20.0		

Table (2): Frequency distribution of studied women (control and study groups) regarding their obstetrics data (n=100).

Items	Control (n=50)		Study (n=50)		X^2	p-value
	No.	%	No.	%		
Length of marriage						
1-5yrs	8	16.0	10	20.0	2.943	.401
6-10yrs	7	14.0	9	18.0		
11-15yrs	15	30.0	19	38.0		
>15yrs	20	40.0	12	24.0		
Min –Max	3-20		3-20			
Mean ±SD	12.85±5.30		12.59±5.14			
Menopausal status						
Premenopausal	32	64.0	28	56.0	1.270	.530
Peri-menopausal	11	22.0	16	32.0		
Postmenopausal	7	14.0	6	12.0		
Use of contraceptive pills						
Yes	42	84.0	37	74.0	1.507	.220
No	8	16.0	13	26.0		

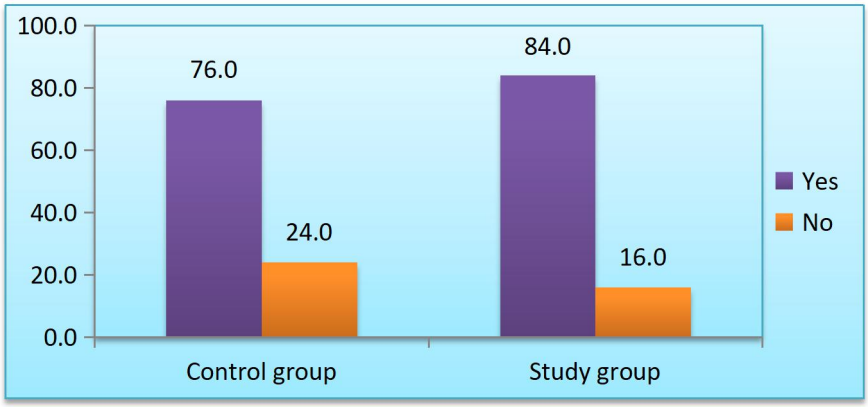

Figure (1): Percentage distribution of the studied women (control and study groups) regarding their history of breast cancer (n=100)

Table (3): Frequency distribution of the studied women (control and study groups) regarding their medical data (n=100).

Items	Control (n=50)		Study (n=50)		X^2	p-value
	No.	%	No.	%		
Presence of other diseases						
Yes	22	44.0	17	34.0	1.051	.305
No	28	56.0	33	66.0		
Site of tumor						
Right side	29	58.0	33	66.0	0.679	.410
Left side	21	42.0	17	34.0		
Presence of metastasis						
Yes	29	58.0	26	52.0	0.364	.546
No	21	42.0	24	48.0		
Time between diagnosis						
<2months	9	18.0	9	18.0	2.277	.685
2-<6months	9	18.0	9	18.0		
6 months- 1 year	24	48.0	24	48.0		
>1 year	8	16.0	8	16.0		
Stage of breast cancer						
1st stage	12	24.0	15	30.0	1.120	.571
2nd stage	17	34.0	19	38.0		
3rd stage	21	42.0	16	32.0		
Type of surgical intervention						
Modified radical mastectomy	36	72.0	39	78.0	0.480	.488
Breast conservative therapy	14	28.0	11	22.0		
Presence of medication						
-Chemotherapy	22	44.0	25	50.0	0.583	.900
-Radiotherapy	13	26.0	10	20.0		
-Chemo and radiotherapy	9	18.0	9	18.0		
-Chemotherapy, radiotherapy and hormonal therapy	6	12.0	6	12.0		
Breast reconstructive operation						
Yes	13	26.0	7	14.0	2.250	.134
No	37	74.0	43	86.0		

Table (4): Mean and standard deviations of the studied women's knowledge (control and study groups) through the program phases (n=100).

Items	Pre program				t1	p-value	Post (after 2 weeks)				t2	p-value	Follow-up (after 3 months)				t3	p-value
	Control		Study				Control		Study				Control		Study			
	Mean	±SD	Mean	±SD			Mean	±SD	Mean	±SD			Mean	±SD	Mean	±SD		
Knowledge about breast cancer and mastectomy	10.00	±2.64	10.32	±2.95	1.419	.191	10.82	±3.45	16.68	±3.01	10.333	.000	10.60	±3.34	15.84	±3.69	8.778	.000
Knowledge about chemotherapy	5.72	±1.52	5.78	±1.68	1.353	.182	5.64	±1.60	9.08	±1.87	11.030	.000	5.56	±1.45	8.36	±2.31	8.373	.000
Total knowledge	15.72	±4.10	16.10	±4.63	1.474	.185	16.46	±4.88	25.76	±4.82	10.977	.000	16.16	±4.66	24.20	±5.81	9.120	.000

*** Statistically significance p<0.05 ** Highly statistically significance p<0.001**

t1 between pre and post program
t2 between post and after 3 months
t3 between pre and after 3 months

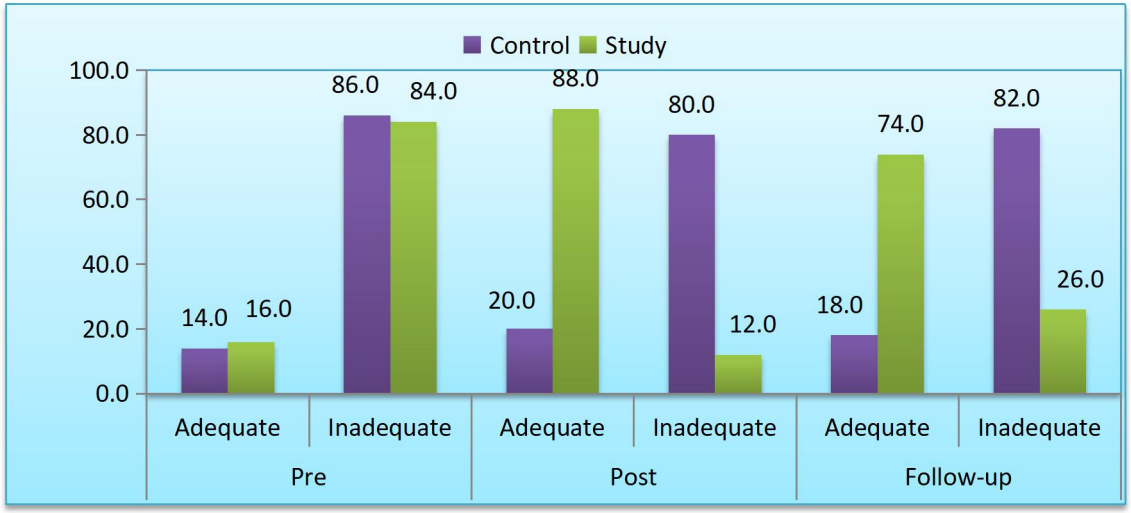

Figure (2): Percentage distribution of the studied women (control and study groups)regarding their total knowledge level through the program phases (n=100).

Table (5): Mean and standard deviations of studied women's total quality of life scores (control and study groups) through the program phases (n=100).

Items of quality of life	Pre program				t1	p-value	Post (after 2 weeks)				t2	p-value	Follow-up (after 3 months)				t3	p-value
	Control		Study				Control		Study				Control		Study			
	Mean	±SD	Mean	±SD			Mean	±SD	Mean	±SD			Mean	±SD	Mean	±SD		
Psychosocial	19.16	±5.42	20.46	±5.18	1.614	.113	19.92	±5.57	40.38	±2.91	20.593	.000	19.66	±5.38	40.74	±3.10	22.243	.000
Physical	22.60	±4.93	23.74	±4.55	0389	.699	22.44	±4.96	17.42	±3.37	6.375	.000	23.52	±3.43	17.52	±3.41	6.702	.000
Sexual	11.78	±3.23	11.74	±3.68	0.825	.413	12.22	±3.67	25.08	±3.10	19.280	.000	11.36	±3.91	23.26	±2.03	19.984-	.000
Total	53.54	±7.54	55.94	±6.87	1.709	.094	54.58	±7.93	82.88	±4.79	21.286	.000	54.54	±7.83	81.52	±5.31	18.926-	.000

*** Statistically significance p<0.05 ** Highly statistically significance p<0.001**
t1 between pre and post program
t2 between post and after 3 months
t3 between pre and after 3 months

Table (6): Mean and standard deviations of studied women's total satisfaction scores (control and study groups) through the program phases (n=100).

Items of satisfaction	Pre program				t1	p-value	Post (after 2 weeks)				t2	p-value	Follow-up (after 3 months)				t3	p-value
	Control		Study				Control		Study				Control		Study			
	Mean	±SD	Mean	±SD			Mean	±SD	Mean	±SD			Mean	±SD	Mean	±SD		
Breast	7.70	2.29	8.34	2.58	1.645	.106	8.10	2.63	12.10	1.61	13.657	.000	7.82	2.29	13.58	1.55	9.920	.000
Radiated breast	14.02	1.84	13.50	2.23	1.869	.116	13.60	2.23	10.12	1.39	13.016	.000	13.88	2.00	9.00	1.82	11.652	.000
Surgeon	19.48	3.64	19.66	3.75	1.644	.107	19.70	3.71	39.58	2.80	32.018	.000	19.06	3.24	40.16	3.04	35.076	.000
Medical team	13.26	3.48	12.78	3.41	1.281	.207	13.18	3.42	22.06	1.94	18.703	.000	12.42	2.82	23.24	2.33	17.429	.000
Office staff	12.08	3.66	12.20	3.60	0.471	.640	12.52	3.63	21.70	1.88	19.339	.000	11.78	2.90	23.82	2.35	19.264	.000
Total	66.54	6.64	66.48	6.96	0.128	.899	67.10	6.91	105.56	3.64	37.631	.000	64.96	5.78	109.80	6.71	50.429	.000

*** Statistically significance p<0.05 ** Highly statistically significance p<0.001**
t1 between pre and post program

t2 between post and after 3 months
t3 between pre and after 3 months

Table (7): Comparison of mean scores of mal adaptive behaviors of the four domains of Roy adaptation model in (control and study groups) through the program phases (n=100).

Domains of Roy's adaptation model	Pre program				t1	p-value	Post (after 2 weeks)				t2	p-value	Follow-up (after 3 months)				t3	p-value
	Control		Study				Control		Study				Control		Study			
	Mean	±SD	Mean	±SD			Mean	±SD	Mean	±SD			Mean	±SD	Mean	±SD		
Psychological	36.32	5.26	35.62	4.93	1.669	.106	35.62	4.93	16.30	2.79	28.689	.000	36.44	4.44	15.94	2.60	27.376	.000
Self-concept	46.54	4.75	45.66	5.33	1.560	.109	44.66	5.33	18.12	3.37	31.780	.000	44.78	5.56	18.56	3.50	28.898	.000
Role function	37.82	5.43	37.34	5.43	1.526	.151	37.34	5.43	17.56	3.99	32.371	.000	37.96	4.85	16.78	4.03	31.162	.000
Interdependence	37.44	4.99	36.90	4.73	1.722	.119	36.90	4.73	14.70	3.03	33.006	.000	37.64	4.01	13.68	3.11	35.749	.000
Total	158.12	10.14	157.52	9.47	1.300	.204	154.52	9.47	66.68	5.27	64.468	.000	156.82	8.22	64.96	5.28	67.867	.000

*** Statistically significance p<0.05 ** Highly statistically significance p<0.001**

t1 between pre and post program
t2 between post and after 3 months
t3 between pre and after 3 months

Table (8): Correlation matrix between total knowledge, total quality of life, total satisfaction, and mal adaptive behaviors of Roy's adaptation model among study group through the program phase (n=100).

Phase	Items		Control				Study			
			Knowledge	Quality	Satisfaction	Roy's	Knowledge	Quality	Satisfaction	Roy's
Pre	Knowledge	r	1	0.208	.670	.104	1	.712	.071	.828
		p-value		.148	.024*	.472		.025*	.623	.031*
	Quality	r	.208	1	.510	.563	.712	1	.720*	.123-
		p-value	.148		.043*	.027*	.025*		.008	.396
	Satisfaction	r	.670	.510	1	.460	.071	.720*	1	.329
		p-value	.024*	.043*		.001**	.623	.008		.019*
	Roy's	r	-.104-	.563	.460	1	.828	-.123-	.329	1
		p-value	.472	.027*	.001**		.031*	.396	.019*	
Post	Knowledge	r	1	.311	.057	.024	1	.880	.419	.185
		p-value		.014*	.693	.869		.045*	.002*	.200
	Quality	r	.311	1	.831	.532	.880	1	.640	.243
		p-value	.014*		.032*	.006*	.045*		.032*	.089
	Satisfaction	r	.057	.831	1	.390	.419	.640	1	.759
		p-value	.693	.032*		.005*	.002*	.032*		.045*
	Roy's	r	.024	.532	.390	1	.185	-.243-	.759	1
		p-value	.869	.006*	.005*		.200	.089	.045*	
Follow-up	Knowledge	r	1	.161	.965	.124	1	-.387-	.260	.038
		p-value		.265	.006*	.390		.005*	.068	.793
	Quality	r	.161	1	-.228-	.281	.387	1	.106	.697
		p-value	.265		.111	.048*	.005*		.465	.016*
	Satisfaction	r	.965	.228	1	.295	.260	.106	1	.296
		p-value	.006*	.111		.038*	.068	.465		.037*
	Roy's	r	.124	.281	.295	1	.038	.697	.296	1
		p-value	.390	.048*	.038*		.793	.016*	.037*	

*** Statistically significance p<0.05 ** Highly statistically significance p<0.001**

Table (9): Correlation between total knowledge scores and demographic characteristics among studied women (control and study groups) through the program phases

Items	Total knowledge score											
	Pre program				Post (after 2 weeks)				Follow-up (after 3 months)			
	Study		Control		Study		Control		Study		Control	
	r	p-value	r	p-value	r	p-value	r	p-value	r	p-value	r	p-value
Age	.596	.000**	.590	.000**	.658	.000**	.731	.000**	.640	.000**	.848	.000**
Education	.519	.000**	.614	.000**	.616	.000**	.695	.000**	.573	.000**	.817	.000**
Job	.679	.000**	.905	.000**	.798	.000**	.234	.101	.750	.000**	.330	.019*
Residence	.304	.032*	.390	.005*	.365	.009*	.551	.000**	.336	.017*	.775	.000**
Income	.680	.000**	.326	.021*	.769	.000**	.540	.000**	.749	.000**	.719	.000**

*** Statistically significance p<0.05 ** Highly statistically significance p<0.001**

Table (10): Correlation between total quality of life scores and demographic characteristics among studied women (control and study groups) through the program phases

Items	Total quality of life score											
	Pre program				Post (after 2 weeks)				Follow-up (after 3 months)			
	Study		Control		Study		Control		Study		Control	
	r	p-value	r	p-value	r	p-value	r	p-value	r	p-value	r	p-value
Age	.241	.092	.011	.941	.231	.107	.340	.016*	.296	.037*	.473	.001**
Education	.217	.130	.106	.464	.208	.148	.237	.098	.283	.046*	.326	.021*
Job	.308	.030*	.157	.276	.296	.037*	.230	.109	.266	.062	.163	.257
Residence	.293	.039*	.085	.558	.286	.044*	.278	.051	.400	.004*	.362	.010*
Income	.264	.064	.179	.213	.306	.031*	.220	.124	.289	.042*	.376	.007*

*** Statistically significance p<0.05 ** Highly statistically significance p<0.001**

Table (11): Correlation between total satisfaction scores and demographic characteristics among studied women (control and study groups) through the program phases

Items	Total satisfaction score											
	Pre program				Post (after 2 weeks)				Follow-up (after 3 months)			
	Study		Control		Study		Control		Study		Control	
	r	p-value	r	p-value	r	p-value	r	p-value	r	p-value	r	p-value
Age	.195	.176	.328	.020*	.284	.045*	.188	.192	.125	.388	.008	.954
Education	.323	.022*	.249	.081	.394	.005*	.096	.507	.165	.253	.082	.570
Job	.172	.232	.059	.682	.258	.071	.316	.025*	.082	.570	.257	.071
Residence	.457	.001**	.459	.001**	.498	.000**	.285	.045*	.327	.020*	.121	.404
Income	.282	.047*	.344	.014*	.362	.010*	.158	.272	.260	.068	.005	.970

*** Statistically significance p<0.05**
**** Highly statistically significance p<0.001**

Discussion

The present study was aimed to evaluate the effect of application Roy's adaptation model on women's satisfaction and quality of life after mastectomy. And the aim was significantly supported through the present study results.

According to demographic characteristic of studied women, the results showed that less than half of control and study groups were in the age group of 45-<55 with mean age 42.97±10.11 for the control group and 42.55±10.05 for study group. Also, more than half of control and study groups have middle income. Such findings disagree with ***Pegorare et al., (2017)*** who found that the studied women were in the age group of 37 to 60 with a mean age of 52.03±1.07 years old and 55% of them have sufficient income for their expenses. This finding might be due to aging process is one of the most important risk factors of breast cancer because of extended life expectancy , changes in reproductive patterns in women over 40 years and genetic damage (mutations) in the body at this age.

In relation to level of education, the current study showed that less than one third of control and study groups had secondary education. This result matches with ***Soliman et al., (2018)*** found that less than half of the studied group had secondary education. Also this finding disagrees with ***Abd El Razik, (2010)*** who reported that the highest percentage of the studied groups was illiterate.

Regarding residence, the current study displayed that more than two thirds of control group and more than half of study group lived in urban areas. This finding matched with ***Abebe et al., (2020)*** and illustrated that less than three quarters of studied patient lived in urban areas.

Concerning occupation, the current study reported that less than three quarters of control group and the most of study group were housewives. This finding is in accordance with ***Hashem et al., (2020)*** who clarified that more than half of patients in both groups were

housewives. This could be attributed to their exposure to household insecticides and detergents that increase breast cancer risk

In relation to menopausal status, the present study showed that around two thirds of the control group and less than two thirds of study group were premenopausal status. This finding is in accordance with ***El-Sayed & Ali, (2011)*** who found that less than two thirds of studied women were premenopausal.

Concerning family history of breast cancer; the current study displayed that slightly more than three quarters of the control group and the most of study group had family history of breast cancer. This finding is in agreement with ***Hagrass et al., (2012)*** who found that a larger proportion of women in the study had positive family history especially first relative degree related to genetic factors. This finding might be due to specific genetic abnormalities that contribute to the development of breast cancer have been inherited.

Regarding site of breast cancer, the current study reported that more than half of the control group and around two thirds of the study group had breast cancer in the right side. This result is near to the result of a study conducted in Ain-shams University by ***El-Feqi et al., (2020)*** and mentioned that more than half of women had right breast cancer.

As regards to breast cancer stage, the present study stated that more than one third of control and study groups had stage II breast cancer. This result is consistent with ***Hawash et al., (2018)*** and mentioned that more than half of studied women were diagnosed with breast cancer at stage II. This result might be due to breast self-examination for early cancer detection was unknown for the majority of women in the study.

Regarding type of surgical intervention, the present study reported that slightly less than three quarters of control group and more than three quarters of study group were treated by modified radical mastectomy. This result is concurrent with the result of ***Tawfik & Yakout, (2016)*** who demonstrated that 40% and 44% were treated by modified radical mastectomy and radical mastectomy respectively.

Regarding total women's knowledge, the current study showed a great improvement in the total knowledge of women with a statistically significant difference between study and control groups post program implementation and at follow up. This result reflects the positive effect of program on the improvement of women knowledge. These results are in agreement with ***Gamee et al., 2019*** who showed significant statistical difference between study and control groups in relation to the total knowledge score after the implementation of the educational intervention.

Concerning total quality of Life scores (QOL) of studied women, the findings of the present study reveals that QOL of the post mastectomy women was improved after three months of implementation of the program. This result may be due to improvement of women's knowledge about disease and management therapies that reflected on improving their quality of life and adaptation to disease.

This findings agrees with ***Nady et al., (2018)*** who found that nearly two thirds of the study group vs. (16%) of the control group had moderate QOL, and the two groups had good QOL in the first visit with no statistically significant difference ($p > 0.05$).

Regarding women's satisfaction throughout the study phases, the current study showed a high statistical significance difference in the study group after two weeks and after three months of program implementation. While for the control group, there was no significance difference in all items of the BREAST-QTM-Mastectomy module through all phases of the study. These findings might be due to the fact that women feel exhausted physically with chemotherapy and radiotherapy as women experience a variety of physical changes that affect the woman emotional reactions, also the educational sessions giving the women the chance to ask questions, listening to their feelings and complains, relieved their fear and anxiety and.

These findings are in agreement with ***Ahmed & Dawood, (2017),*** who reported that the present study shows high statistical significance difference in the intervention group satisfaction after implementation of the educational program with breast, medical staff, physical wellbeing, sexual wellbeing, and psychosocial wellbeing, but there was no significance difference within the same group in their satisfaction about surgeon and the office staff. While for the control group, there was no significance difference in all items of the BREAST-QTM-Mastectomy module through all phases of the study.

Concerning the effect of educational program based of Roy's adaptation model on improving mal adaptive behavior of women, the findings of the present study demonstrated that there was no significant differences between control and study groups pre implementation of the program while, there was a highly significant differences between both groups after three months of follow up

phase (P ≤ 0.001). This result reflected the positive effect of the educational program on improving women's mal adaptive behaviors regarding mastectomy and women's understanding of the effect of lymphedema as a problem post mastectomy that will affect quality of life if the women complained it.

Concerning the relation between the studied women's satisfaction and QoL, the present study showed positive correlation between studied women satisfaction and quality of life for the study group. This finding matches with ***Erdogan & Karakas, (2019)*** who found a positive significant correlation between sexual life quality and marital satisfaction (p ≤ 0.01). This might be due to the couples that have achieved sexual satisfaction are also satisfied with their married life.

As regards to relation between studied women's knowledge and demographic characteristics, the present study clarified that there was a highly statistically significant difference between total knowledge of the control and study groups and their demographic characteristics (age, education, occupation and income) at pre, post program and at follow up phases. This finding is supported with ***Borman et al., (2017)*** who reported that there was statistically significant difference between the knowledge of the studied women and their educational level; also the educated women shortly after their surgery had higher QoL scores indicating a non- impaired wellbeing.

Regarding the relation between the studied women QOL and demographic data, the present study showed that there was a positive statistical significant correlation in the study group between total QOL and occupation and residence preprogram implementation. This finding disagreed with ***Nady et al. (2018),*** who reported that there is no significant correlation between demographic data and QOL as regards study and control groups of the studied women except on the control group; income was a significant predictor of positive effect on QOL during the first visit (r= 0.344, p<0.05).

Conclusion

In the light of the results of the present study it was concluded that the application of Roy's adaptation model was effective on improving post mastectomy women's knowledge regarding breast cancer, mastectomy and chemotherapy. Also, it had a positive effect on improving women's quality of life and satisfaction. Moreover, the health education program based on RAM promotes women's adaptation to the disease and treatment regimen.

Recommendations

- An educational program should be provided to all nurses on the oncology departments to promote their knowledge to educate women about disease and management.
- Peer educational program should be included as part of the women's treatment program to reduce the symptoms of cancer and improve the quality of life.
- Dissemination of the educational booklet to all oncology departments at Benh city to improve women's knowledge, quality of life, satisfaction and adaptation to breast cancer and treatment regimen.
- Replication of the study using a larger sample size and different geo-graphical areas for generalization of results.

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