Effect of Educational Program Regarding Therapeutic Exercises on Women's Pain, Fatigue and Shoulder Function Undergoing Mastectomy

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Abstract: Breast cancer is the most common form of cancer in females worldwide and the most prevalent cancer among Egyptian women. Breast cancer and its treatment result in physical and psychological problems; pain, fatigue and dysfunction. It is the responsibility of the nurse to identify the breast cancer patient's needs, make appropriate nursing diagnosis and initiate plans for care. Aim of the study: to assess the impact of an educational program regarding therapeutic exercises for women's pain, fatigue and shoulder function that are undergoing mastectomy. This study was hypothesized that there would be an improvement of patients' information, pain, fatigue and shoulder function by using the therapeutic exercises. Quasi experimental design was utilized in this study. It was conducted at Oncology Center Mansoura University. Purposive sample included (80) patients with preliminary diagnosis of breast cancer, were admitted to female surgical units, scheduled for Modified radical mastectomy and were divided random equally into study and control groups; (40) patients in each group. Tools: used for data collection included an interviewing questionnaire sheet, Numerical Rating scale, Fatigue Severity scale and Shoulder Pain and Disability Index, performance observational checklists, and follow up sheet. Results: The mean age of the studied women 45.25 and 46.06. The majority of the women in both groups were married; housewives and 45% were illiterate. There was a highly significant difference in patients' level of information, pain intensity, fatigue severity, and shoulder dysfunction of the study group as compared to the control group. This means that the educational program had positive effect in reducing patients' pain, fatigue and shoulder dysfunction, post program and after one month of implementation of the educational program. Conclusion: There were a statistical significance difference between the two groups in relation to information, fatigue severity, pain intensity, shoulder pain and disability, and performance post program and follow-up after one month. Deep breathing and Progressive muscle relaxation techniques, arm and shoulder exercises, and patient's education are useful adjuvant techniques to complement medical treatment. Recommendations: Continuous educational health programs are recommended. So incorporation of such interventions in the care plan can enhance the care for surgical breast cancer patients and greatly improve their quality of life.

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Key words: therapeutic exercises, pain, fatigue, arm and shoulder exercises, mastectomy, and progressive muscle relaxation technique.

1. Introduction

Breast cancer is a serious disease with potential high morbidity and mortality. It is the commonest malignancy in women. Approximately one million new cases of breast cancer are diagnosed each year worldwide **(Nevidjon and Sawers, 2000; Mahmoud, 2002).** In Egypt, breast cancer is the most common cancer among women, representing18.9% of total cancer cases (35.1% in women and 2.2% in men) among the Egyptian National Cancer Institute (NCI) series of 10 556 patients during the year 2001 ,with an age-adjusted rate of 49.6 per 100 000 population (**Salem et al., 2010**). In Mansoura University Hospital, 686 new breast cancer cases of total 2796 cancer cases were diagnosed in 2010 and they were under radiotherapy or chemotherapy or chemo radiotherapy treatment after surgical intervention (**Statistical Nuclear Medicine department, 2011**).

Breast cancer and its treatment result in physical and psychological problems; pain, fatigue and dysfunction. It is the responsibility of the nurse to identify the breast cancer patient's needs, make appropriate nursing diagnosis and initiate plans for care **(WHO, 2011; Salem et al., 2010).**

Cancer treatments may result in better survival outcomes, which are certainly desirable; however, treatments may negatively affect quality of life, with increased symptoms impacting functional status. Symptoms that are particularly prevalent and bothersome are fatigue and pain (**Mitchell et al., 2007**). Surgery is an essential part of all current treatments to cure breast cancer. It often involves lymph nodes dissection which may result in a

deterioration of postoperative function; decreased shoulder and arm mobility, strength, pain, decreased range of motion, and muscle weakness **(Montgomery et al., 2010; Ackroyd & Reed, 1997)**.

Breast cancer presents nurses with many challenges along a continuum of prevention, early detection, treatment, and survival **(Langhorne et al., 2007).** Behavioral intervention with patients undergoing cancer treatment has received wide acceptance from both front-line medical staff and patients. Behavioral intervention procedures are now among the most widely offered psychosocial services at comprehensive cancer centers (**Coluzzi, et al., 1995**).

Therapeutic exercise has numerous benefits for all patients. Exercises are essential to the prevention of shortening of the muscles, prevention of contracture of the joints, and improvement in lymph and blood circulation after mastectomy, (**Mosby's Medical Dictionary, 2009**). Therapeutic exercise programs should consist of endurance, resistance, and flexibility training. Patients should be encouraged to progress with their exercise programs so that they can continue to benefit from them (**Lieberman, 2012**). Relaxation training is one of such behavioral intervention that has been used to counteract the adverse effects of cancer treatments. More recent studies suggest that relaxation, induced in varying ways, influences the experience of pain and fatigue (**Dowarah, 2008; Comer, et al., 1995; Davis & Riches, 1995; Ferrell-Torry & Glick, 1992**).

Non pharmacological interventions for pain and fatigue include exercise, energy conservation, sleep and rest, stress management, and psychosocial support, as well as nutritional support and supplements **(Langhorne etal., 2007).** Muscular relaxation exercises and deep breathing are two common techniques to help people to relief pain, relax and combat symptoms of anxiety. Deep breathing for relaxation is easy to learn and contributes to pain relief or reduction by reducing muscle tension and anxiety. Also, deep relaxation can be produced by progressive relaxation training that can reduce anxiety and excessive muscle contraction and can promote the onset of sleep (**Black and Hawks, 2009**). Therefore we assess the impact of an educational program regarding therapeutic exercises for women's pain, fatigue and shoulder function that are undergoing mastectomy.

Significance of the study:

Pain, fatigue and shoulder dysfunction were recognized as a distressing side effects of surgery and treatment for breast cancer, they have impact on the patient's functional status and consequently quality of life. Therefore, the management of these side effects represents a great challenge for the nurse. Using of measures, which are inexpensive, available, self induced by the patient, easy to learn and free from side effects could be effective in management of pain, fatigue and prevent of shoulder dysfunction. In an attempt to assess and test the effect of such measures, this study was conducted to assess the effect of educational program regarding therapeutic exercises for women undergoing mastectomy. So that, there is a great interest to conduct such type of research which might assist such patients to safely and effectively cope with the remarkable physical and psychological changes, hoping to improve their quality of life (QOL).

Aim of the Study

The aim of this study was to assess the impact of an educational program regarding therapeutic exercises for women's pain, fatigue and shoulder function that are undergoing mastectomy. It was hypothesized that improvement of patients' information, pain, fatigue and shoulder function by using the therapeutic exercises in the study group than control group.

Subjects and Methods

Study design

Quasi experimental research design was utilized in this study.

Setting

This study was conducted at Oncology Center, Mansoura University in the female surgical wards, ward A for study group, word B for control group preoperative and then, followed in outpatient clinics postoperative for follow up.

Sample

The purposive sample of this study included (80) patients with preliminary diagnosis of breast cancer, were admitted to female surgical wards in the Oncology Center, Mansoura University, scheduled for mastectomy and were divided random equally into study and control groups; (40) patients in each group. Both groups received the usual hospital routine of care. Patients were selected from the two wards (A & B).

They enrolled in this study according to the following inclusion criteria; adult females, accepted to participate in the study, scheduled for Modified radical mastectomy, in preoperative period, 35-55 years, had primary breast cancer were eligible for the study. Patients with secondary breast cancer or previous history of cancer or previous history of chronic illness (such as DM, liver disease, renal impairment) were excluded from the study subjects, as these conditions can represent a change in patients' pain and fatigue. They were interviewed and followed-up by the researcher.

Tools of data collection

Four tools were used for data collection,

namely an interview form, Numerical Rating Scale, Fatigue Severity scale (FSS) and Shoulder Pain and Disability Index (SPADI*)* an observation checklist, and Follow up sheet. The interview form was constructed by the researchers and consisted of five parts; the first part covered patient's socio-demographic data. The second part covered patients past, present, gynecological and family history. The third part involved patient's information questionnaire sheet covering women's information regarding diagnosis, lines of treatment, how to deal with postoperative pain, care of the operative site, arm and shoulder exercises postoperative. The fourth part was concerned with pain assessment sheet and the fifth part was concerned with fatigue assessment sheet. Each correct answer took one score and the question answered with "No", or incorrect, was given a zero.

The second tool consisted of three scales; Numerical Rating Scale, Fatigue Severity scale (FSS) and Shoulder Pain and Disability Index (SPADI*). **Numerical Rating scale*** was used to measure pain intensity, 0 indicates no pain, 1-3 means mild pain, 4-6 means moderate pain, 7-9 means severe pain and 10 means worst pain (**McAffery & Beebeg, 2003)**. The use of Numerical Rating scale is an easy and reliable method of determining pain intensity.

Fatigue Severity scale (FSS) was adopted from (**Krupp et al., 1989**) to measure fatigue severity. It consisted of 9 statements and the patient was asked to respond to each statement by describing the degree of agreement; strongly disagree (low fatigue level) to strongly agree (high fatigue level), strongly disagree took one score, disagree took two scores, neutral took three scores, agree took four scores and strongly agree took five scores. The total score ranges from 9 to 45; the score from 13.5 to 22.5 means mild fatigue, 23 to 31.5 means moderate fatigue and score more than 31.5 means severe fatigue. The scale was translated into Arabic by the researchers and some modifications were done. Reliability test was done, using Crombach`s alpha test that measured the degree of reliability. It showed high reliability of this (FSS) scale. Alpha = 0.85.

Shoulder Pain and Disability Index (SPADI), by **Roach et al., (1991**).

It is a self-administered questionnaire that consists of two dimensions, one for pain and the other for functional activities. The pain dimension consists of five questions regarding the severity of an individual's pain. Functional activities are assessed with eight questions designed to measure the degree of difficulty an individual has with various activities of daily living that require upper extremity use. The SPADI is the only reliable and valid region-specific measure for the shoulder. The scale was translated into Arabic and some modifications were done by the researchers. Reliability test was done, using Crombach`s alpha that measured the degree of reliability. It showed high reliability of the total (SPADI) scale, Alpha = 0.96. It showed high reliability of the pain subscale, Alpha = 0.99 and functional activities subscale, Alpha = 0.85. Scoring instructions**;** to answer the questions, patients place a mark on a numeric rating scale for each question. Verbal anchors for the pain dimension are 'no pain at all' and 'worst pain imaginable', and those for the functional activities are 'no difficulty' and 'so difficult it required help' (**Roach, 1991**).

The third tool was an observation checklist: designed to assess patient's practice regarding; arm and shoulder exercises, deep breathing, progressive muscle relaxation technique (PMRT) **Breast cancer .org (2012)** and breast self examination **Black, J. & Hawaks, J. (2009)**. The steps of these procedures were translated into Arabic by the researchers after reviewing the literature**;** Medical-surgical nursing, nursing procedure books, and expert's opinions. The observational checklist steps were carried out by the patient three times; one before the program to assess her performance, the second was on the second day postoperatively and the third was one month post mastectomy. The actual practice was compared with standardized procedures. Accordingly, subjects were given 1 point if the step was correctly done and zero if incorrect. The points were summed up and converted into a percent score. A total score of 60% or higher was considered adequate practice.

The fourth tool was a follow up sheet to determine the effect of therapeutic exercise for the women undergoing mastectomy. It was collected one month post mastectomy, consisted of 10 items. It was designed by the researcher to determine the effect of therapeutic exercise for the women undergoing mastectomy.

Pilot study

A pilot study was conducted on eight (10%) female patients undergoing mastectomy from the Oncology Center to test the applicability and relevance of the study tools and test clarity of the designed questionnaire as well as to estimate the time needed to answer them, and then the necessary modification was done. These patients were excluded from the study sample.

Administrative design and ethical considerations:

The necessary official approvals were obtained from the Heads of the oncology units and outpatient Departments, and from the General Directors of Zagazig and Mansoura University Hospitals. Letters of request were issued to them from the Faculties of Nursing at Zagazig and Mansoura Universities explaining the aim of the study and its procedures.

Before the initial interview, an oral consent was secured from each subject after being informed about the nature, purpose, and benefits of the study, as well as any potential side effects. Patients were also informed that participation is voluntary and about their right to withdraw at any time without giving reasons. Confidentiality of any obtained information was ensured through coding of all data. The researcher reassured patients that the data will be used only to improve their health and for the purpose of the study.

Field work:

After securing official permissions to carry out the study, the researcher met with the potential participants in the oncology unites. The aim of the study was explained to them and their informed consent was secured before collecting data. The fieldwork was carried out along a period of twelve months (November 2010 till January 2011). Every patient was interviewed for about 30-45 minutes.

Teaching was carried out individually by the researchers for each patient with one of her family member to help in following the program guidelines at home. The program was covered by 11 sessions, 2 sessions for theoretical part and 4 sessions for practice; demonstration and redemonstration till the patient acquired good information and well practice, 2 sessions for pretest, 2 sessions for posttest and one session for follow up.

The evaluation of the guidelines' effect was carried out using the aforementioned tools. Each patient was evaluated three times during the study: immediately upon presenting to the surgical units (pre-test), on the second postoperative day after implementation of the guidelines (post-test), and one months after implementation of the guidelines (follow-up).

Directly the researcher began the first session of the program for the women immediately on admission, to collect information pre program in both groups, then provided information that was needed and practice (arm and shoulder exercises, relaxation exercises; deep breathing and progressive muscle relaxation technique), demonstration and redemonstration several times until doing without error for study group. On the second postoperative day, the researcher meet each woman of the study group and control group individually and collecting data related to research instruments (Numerical Rating Scale, FSS, and SPADI). After discharge, the researcher called each woman in the study group by telephone to be sure that she was following the given instructions, encouraging and reinforcing her to follow the given instructions, continue and practice (arm and shoulder exercises, and relaxation exercises).

After one month post mastectomy, patient came to the outpatient clinic for follow up; the researcher recollected data related to research instruments (Numerical Rating Scale, FSS, SPADI, and performance checklists) was done for each patient in both groups.

Statistical analysis

Data entry and statistical analysis were done using SPSS 15.0 statistical software package. Data were presented using descriptive statistics in the form of frequencies and percentages for qualitative variables, and means and standard deviations for quantitative variables. Qualitative categorical variables were compared using chi-square test. Statistical significance was considered at p-value <0.05.

Limitation of the study

Great effort was needed to conduct the program as the researcher met each patient individually. Short preoperative period to implement the program, as some patients were admitted four days preoperatively.

3. Results

Table (1) showed socio demographic characteristics for the women undergoing mastectomy. As shown the mean age of the participants was 45.25 ± 5.86 and 46.06 ± 6.19 for study group and control group, respectively. Most of the women in both groups were married 80% and 75%, respectively. As regards to employment status (72.5% and 75% of the study group and control group, respectively) were housewives. In relation to educational level, 37.5% and 45% in the study group and control group, respectively, were illiterate, 20% and 22.5% had secondary education respectively.45% and 65% of the study group and control group, respectively, residence in rural areas.

Table **(2)** represented comparison of means of the two groups in relation to total information and total performance in each procedure pre program, post program and follow-up after one month postoperative. It is apparent from this table that the study group had high significant mean scores in each procedure as compared to the control group, post program. This highly significance difference ($p< 0.001$) continued after one month of the implementation of the educational program.

Table **(3)** indicated comparison between the two groups in relation to pain intensity, fatigue severity and shoulder function as measured by Pain Rating Scale, FSS and SPADI respectively, post program and follow up after one month. As shown above there is a highly significant difference in patients' pain intensity, fatigue severity and shoulder

function of the study group as compared to the control group post program and after one month ($p< 0.001$).

Table **(4)** Correlation between patients total performance scores (arm and shoulder exercises, deep breathing, and PMRT) and outcome variables preprogram, post program and follow up after one month for the intervention group. As shown, there was a significance reversed relationship between each of patient's pain intensity, fatigue severity and SPADI scores and total performance scores post program and follow up. This means that increased of performance would be associated with low pain intensity, low fatigue severity and low scores of SPADI post program and follow up.

Table **(5)** illustrated the correlation between patients' total information and outcome variables preprogram, post program and follow up after one month for the intervention group. As shown, there was a significance negative relationship between patient's total information scores and each of patient's pain intensity, fatigue severity and SPADI scores. This means that the patient who had good information would have less pain intensity, less fatigue severity and less shoulder dysfunction post program and follow up.

Table **(6)** presented correlation between patients' sociodemographic data and research variables; preprogram, post program and follow up after one month for the intervention group. As shown above there was a significance negative relationship between patient's age and both of patient's total information scores ($r = -0.536$ and $P= 0.01$, $r = -0.522$ and $P= 0.001$) and total performance scores, ($r = -0.630$ and $P= 0.000$, $r = -0.633$ and $P= 0.000$) post program and one month post mastectomy, respectively. This means that younger patient had more information and performance than the older one, and vice versa.

There was a positive correlation between patient's age and each of pain intensity, fatigue severity and SPADI scores post program and follow up. This means that younger patient had less pain, fatigue and SPADI scores than the older one, and vice versa. There was a positive correlation between patient's education and both of patient's total information and total performance scores post program and follow up. This means that the younger and highly educated patients had a good information and performance, and vice versa. There was a negative correlation between patient's education and each of patient's pain, fatigue and SPADI scores post program and follow up.

Table (1): Sociodemographic characteristics in both groups of women undergoing mastectomy. (n = 40)

Item	Study group (n = 40)		Control group (n = 40)		P value
	No	%	No	%	
Age	45.25 ± 5.86		46.06 ± 6.19		0.548
35 – < 40	7	17.5	6	15	0.314
40 – < 45	7	17.5	13	32.5	
45 – < 50	14	35	8	20	
50 – 55	12	30	13	32.5	
Marital status					
Single	1	2.5	0	0.0	0.642
Married	32	80	30	75	
Widow	4	10	5	12.5	
Divorced	3	7.5	5	12.5	
Employment status					
Employer	6	15	5	12.5	0.947
Worker	5	12.5	5	12.5	
Housewife	29	72.5	30	75.0	
Education					
Illiterate	15	37.5	18	45	0.441
Read and write	7	17.5	9	22.5	
Primary/prep.	5	12.5	1	2.5	
secondary	8	20	9	22.5	
University	5	12.5	3	7.5	
Residence					
Rural	18	45	26	65	0.072
Urban	22	55	14	35	

* Statistically significant at $P \leq 0.05$

Table (2): Comparison of means of the two groups in relation to their information and performance in pre program, post program and follow-up after one month.

Items	Preprogram		P	Post program		P	Follow Up		P
	Study	Control		Study	Control		Study	Control	
Total information	5.93 ± 2.40	6.84 ± 6.55	0.411	94.76 ± 4.57	9.06 ± 8.15	<0.001*	97.03 ± 2.28	13.84 ± 11.22	<0.001*
Total performance									
Arm and shoulder exercise	0.00 ± 0.0	0.08 ± 0.35	0.183	16.93 ± 0.94	0.28± 0.55	0.001	42.23 ± 1.12	0.48 ± 1.91	0.001*
Deep breathing	0.08 ± 0.47	0.13± 0.56	0.669	5.43± 0.78	0.13± 0.56	0.001	5.93 ± 0.27	0.18 ± 0.78	0.001*
Progressive muscle relaxation technique (PMRT)	0.00 ± 0.00	0.00± 0.00	-	21.48 ± 1.11	0.00± 0.00	0.001	22.25 ± 0.87	0.00 ± 0.00	0.001*
Breast self examination (BSE)	0.28± 0.99	0.43 ± 1.06	0.514	10.68 ± 0.53	0.68± 1.51	0.001	11.75 ± 0.54	2.30 ± 3.78	0.001*

* Statistically significant at P ≤ 0.05

Table (3): Comparison between the two groups in relation to pain intensity, fatigue severity and shoulder function as measured by Pain Rating Scale, FSS and SPADI respectively, preprogram, post program and follow up after one month.

	Preprogram				Post program				Follow-up			
	Study		Control		Study		Control		Study		Control	
	No	%	No	%	No	%	No	%	No	%	No	%
Pain intensity												
No Pain	0	0	6	15	0	0	0	0	0	0	0	0
Mild	30	75	23	57.5	0	0	0	0	40	100	0	0
Moderate	10	25	10	25	39	97.5	6	15.0	0	0.0	35	87.5
Severe	0	0	0	0	1	2.5	32	80.0	0	0	0	0
Worst	0	0	1	2.5	0	0	2	5.0	0	0	5	12.5
P	0.048				<0.001*				<0.001*			
Fatigue severity												
Mild	13	32.5	16	40	17	42.5	0	0.0	14	35	0	0.0
Moderate	24	60	16	40	15	37.5	5	12.5	26	65	2	5
Severe	3	7.5	8	20	8	20	35	87.5	0	0.0	38	95
P	0.123				<0.001*				<0.001*			
Shoulder pain and disability												
No disability	34	85	30	75	0	0.0	0	0.0	0	0.0	0	0.0
Minimal	3	7.5	8	20	0	0.0	0	0.0	36	90	0	0.0
Moderate	3	7.5	0	0.0	10	25	2	5	3	7.5	1	2.5
Severe	0	0.0	1	2.5	12	30	5	12.5	1	2.5	7	17.5
Crippled	0	0.0	1	2.5	15	37.5	6	15	0	0.0	31	77.5
Bed bound	0	0.0	0	0.0	3	7.5	27	67.5	0	0.0	1	2.5
P	0.111				<0.001*				<0.001*			

* Statistically significant at P ≤ 0.05

Table (4): Correlation between patients total performance scores (arm and shoulder exercises, deep breathing, and PMRT) and outcome variables preprogram, post program and follow up after one month for the intervention group.

Research variables	Performance	
	r	p
Preprogram		
Pain intensity	0.237	0.140
Fatigue	-0.234	0.147
SPADI	-0.108	0.509
Post program		
Pain intensity	-0.415	0.005*
Fatigue	-0.607	<0.01*
SPADI	-0.508	0.003*
Follow-up		
Pain intensity	-0.392	0.013*
Fatigue	-0.343	0.033*
SPADI	-0.577	<0.01*

* Statistically significant at P ≤ 0.05

Table (5): Correlation between patients' total information scores and outcome variables preprogram, post program and follow up after one month for the intervention group.

Research variables	Information	
	r	p
Preprogram		
Pain intensity	0.178	0.271
Fatigue	-0.137	0.399
SPADI	0.042	0.797
Post program		
Pain intensity	-0.378	0.024*
Fatigue	- 0.410	0.016*
SPADI	-0.315	0.031*
Follow-up		
Pain intensity	-0.389	0.029*
Fatigue	-0.311	0.038*
SPADI	-0.449	0.004*

* Statistically significant at P ≤ 0.05

Table (6): Correlation between patients' sociodemographic data and research variables; preprogram, post program and follow up after one month for the intervention group.

Research variables	Age		Education	
	r	p	r	p
Preprogram				
Women's inform. scores	-0.225	0.162	0.691	0.05*
Women's perform. scores	-0.070	0.666	0.335	0.05*
Pain intensity	-0.382	0.015*	0.287	0.073
Fatigue	-0.167	0.304	-0.051	0.754
SPADI	0.200	0.215	0.099	0.542
Post program				
Women's inform. scores	-0.536	0.01*	0.447	0.004*
Women's perform. scores	-0.630	0. 000*	0.418	0.041*
Pain intensity	0.398	0.021*	-0.471	0.022
Fatigue	0.358	0.023*	-0.308	0.045*
SPADI	0.364	0.019*	-0.316	0.038*
Follow-up				
Women's inform. scores	-0.522	0.001*	0.435	0.005*
Women's perform. scores	-0.633	0. 000*	0.563	0.01*
Pain intensity	0.410	0.01*	-0.420	0.018*
Fatigue	0.339	0.011*	-0.360	0.021*
SPADI	0.478	0.002*	-0.478	0.004*

* Statistically significant at P ≤ 0.05

4. Discussion

The results of the current study revealed that a mean age of the participant women was 45.25 ± 5.86 and 46.06 ± 6.19 for study group and control group, respectively. The majority of the women in both groups were married, and most of them were housewives. In relation to educational level, more than one third of the study group and less than one half of the control group were illiterate. Less than one half of the study group and less than two third of the control group reside rural areas. In the same line, **NCI (2010)** reported that the mean age of cancer is 48 years in Egypt.

Pain can be a result of the therapy used to actually reduce or eliminate the cancer. Patients have the potential to develop pain as a side effect of specific surgical procedures, chemotherapeutic agents, and radiation therapy. Acute post surgical pain is initially intense and gradually lessens over time as healing occurs (**McEvoy, et al. (2011)**; **Biondolillo, (2009)**. **Elkin et al. (2007)** and **Carr & Mann (2000)** mentioned that the obligation to manage pain and relieve a patient's suffering is an important part of a health professional's commitment and specified nurses for relieving postoperative pain.

The importance of pain management is further increased when benefits for the patients are realized earlier mobilization, shorten hospital stay and reduced costs (**Mohamed, 1993**). A combination of pharmacological and non-pharmacological pain control will achieve the best relief for the patient's pain (**Linton, 2007**).

Of prime importance was information related to what to do about pain and side effects after discharge. Because patients place high importance on information about the pain experience, the pain management plan after discharge, and side effect management, health care professionals need to focus their pain management counseling in these areas **(Kastanias et al., 2009)**.

Results indicated that pre surgery distress uniquely contributed to patients' post surgery pain severity ($P < 0.05$) and fatigue ($P < 0.003$) (**Montgomery et al., 2010**). In the same line, **Mohamed (2009)** found that more than two thirds of the patients felt fatigue and pain postmastectomy which effect on their activities of daily living.

The results of the current study presented that there was a highly significant difference in patients' pain intensity of the intervention group as compared to control group post program and after one month ($p < 0.001$). This is in agreement with **Lin (2012)** who found that the least pain severity scores in the experimental were lower than those in the control group ($p < 0{\cdot}05$).Patients reported that relaxation therapy helped them relax and promoted sleep. He recommended that relaxation therapy (breath relaxation and guided imagery) could complement analgesics to help postoperative patients better manage pain and anxiety.

The present findings are in agreement with **Charalambous (2011)** who concluded that the use of Mind-Body techniques (progressive muscle relaxation and guided imagery) were effective in reducing the levels of anxiety, depression and body discomfort in patients who had breast cancer. These simple, inexpensive and non-invasive interventions have the potential to enhance the psychological and physical wellness in these patients. In addition, relaxation and imagery training reduced cancer treatment-related pain.

Chen et al. (2009) proved that the degree of anxiety improvement was significantly higher in the progressive muscle relaxation training group than in the control group after progressive muscle relaxation training intervention ($p < 0.0001$) and at follow-up ($p = 0.0446$).

Ghafari et al. (2009) found that there was a significant difference in mean score of whole and dimensions of health-related quality of life between two groups in three times ($p < 0.05$). They concluded that this study provided modest support for the effectiveness of Progressive Muscle Relaxation Technique on quality of life of multiple sclerosis patients. Progressive Muscle Relaxation Technique (as a form of complementary therapies) is practically feasible and is associated with increase of life quality of multiple sclerosis patients; so that health professionals need to update their knowledge about complementary therapies.

These findings go in harmony with **Dowarah (2008)** who found that cognitive behavior therapy (progressive muscle relaxation technique) as a type of complementary therapy had a statistical significance effect on decreasing pain in the study group.

In the same harmony, **Seers et al. (2008)** reported that relaxation is increasingly suggested as a pain control technique that can be used by nurses in daily practice. These findings are also consistent with a number of studies that have concluded that preparatory preoperative information can have a positive effect on a patient's experience of acute surgical pain (**Niemi-Murola, et al., 2007; Oshodi, 2007; Walker, 2007**).

Roykulcharoen & Good (2004) found that that systematic relaxation reduced patient's pain and increased their sense of control. They reported that unrelieved pain after surgery can lead to complications, prolonged hospital stay, and delayed recovery. it is important to use non-pharmacological methods in addition to analgesics to decrease patient discomfort and anxiety. They recommend that nurses try relaxation with postoperative patients, in addition to analgesic medication, measuring pain scores and asking about cultural acceptance.

These findings are consistent with **Mohamed (1993)**, who found that a significant difference of total pain scores between the trained and control group ($p < 0.001$), that relaxation training preoperatively decreased patient's postoperative total pain scores. Relaxation training decreased patient's pulse, respiration, and blood pressure. He concluded that relaxation technique decreased anxiety preoperatively, decreased patient's pain sensation postoperatively, and the trained group expressed lower fear of pain and lower pain response postoperatively than the control group.

In the same line, **Binns-Turner (2008)** suggested from his study that preoperative relaxation improved immediate postoperative outcomes for women undergoing a mastectomy for breast cancer. Relaxation training also proved to have a significant effect on the emotional adjustment, variables depression, anxiety and hostility (**Luebbert et al., 2001**). **Mundy, et al. (2003)** reported that behavioral intervention integrating several behavioral techniques can decrease levels of anxiety and distress associated with invasive treatments and cancer diagnosis.

Relaxation training is more effective method to relief pain without side effects, in addition, it can increase comfort level, reduce the amount of analgesics required postoperatively and reduces distress associated with pain **(Mohamed, 1993)**.

Sjoling, et al. (2003) found that for the treatment group "postoperative pain declined more rapidly, degree of preoperative state anxiety was lower and they were more satisfied with postoperative pain management" than for the control group. There is growing evidence that the preoperative education of patients about postoperative pain and pain control can influence their postoperative pain experience and their satisfaction with pain management.

Postoperative pain is considered acute, but easily managed by proper nursing measures. Postoperative pain begins before operation by ensuring that the patients are aware that pain is to be expected, but that it can be controlled **(Mohamed, 1993)**.

Basavanthappa (2009b) accepted that relaxation technique effect on muscle tension of postoperative patients reduces the psychological discomfort associated with pain.

Fatigue or tiredness is a side effect that is characterized as, "a persistent subjective sense of tiredness related to cancer or cancer treatment that interferes with usual functioning" (**Cramp & Byron-Daniel, 2012**; **McKenzie & Kalda (2003).** Fatigue is the most common side effect of breast cancer treatment. Some doctors estimate that 9 out of 10 people experience some fatigue during treatment (**Breast cancer.org, 2012**).

It is important that individuals with cancer receive appropriate support and advice to help them cope with any side effects of the treatment or disease. Physical exercise has been suggested as helpful in reducing the fatigue that is associated with cancer (**Cramp & Byron-Daniel, 2012**).

The results of the present study revealed that there was a statistical significance difference between the two groups in relation to fatigue severity in post program and follow-up after one month ($p < 0.001$). This means that the intervention group suffered less fatigue after implementation of the program than the control group. Along with an exercise component (deep breathing and progressive muscle relaxation technique), the patients received education about diet, physical activity, and social support.

These results are in consistent with **Mohamed (2012)** who found that a decrease in fatigue severity in the study group with a highly statistical significance difference between the study group, who followed the nursing management program as progressive muscle relaxation technique, patient education about diet, life style modification, and the control group. In the same line, **Cramp & Byron-Daniel (2012)** reported that results suggested that physical exercise such as aerobic walking and aerobic cycling could help to reduce fatigue both during and after treatment for cancer. The benefits of exercise on fatigue were observed specifically for people with breast cancer and prostate cancer.

These findings are in agreement with the results of **Cantarero-Villanueva et al. (2011**) who found that an 8-week multimodal program was clinically effective for decreasing cancer-related fatigue, reducing α amylase activity and increasing shoulder and cervical active range of motion compared to usual health care in breast cancer survivors. The study group experienced a greater decrease of fatigue as compared to the control group in all dimensions and the total score. The study group maintained the improvements of fatigue after 6 months follow-up.

Demiralp et al. (2010) proved that the progressive muscle relaxation group experienced a greater increase in improved sleep quality and a greater decrease in fatigue than the control group. The findings indicated that progressive muscle relaxation training would improve sleep quality and fatigue in patients with breast cancer undergoing adjuvant chemotherapy. This is in harmony with **Dowarah (2008)** who proved that progressive muscle relaxation technique had effects on decreasing fatigue in the study group, which in turn, improved patient's QOL.

Página (2012) reported that research and anecdotal evidence showed that lifestyle changes, such as exercising more, relieving stress, and eating a healthy, well-balanced diet can help ease fatigue. **Chung (2008)** and **Stevinson** and **Fox (2005)** noted that regular physical exercise improved both mood and quality of life of cancer patient. In the same line, **Winters-Stone et al. (2008)** proved that the physical activity program improved fatigue; the higher physical activity levels, the less fatigue were reported by women. **Banthia et al. (2009)** recommended that interventions targeting the improvement of mood and sleep should be considered as alternate approaches to reduce fatigue.

These findings are in agreement with the results by **Keyes (2001)** whose results indicated that fatigue management interventions lessened fatigue to a statistical significance of < 0.05 in the area of behavioral, sensory, cognitive, and total fatigue. Posttest, the patients ranked the most helpful interventions as short naps, exercise, and relaxation techniques learned at the class opposed to the long napping approach that predominated prior to the class.

Also, these findings are in agreement with the results of **Gaston-Johansson et al. (2000)** who reported that the comprehensive coping strategy program (CCSP) was found to be effective significantly in reducing nausea and fatigue. In addition, **Bower et al. (2000)** suggested that treating pain and depression which were strongly associated

with fatigue, might be useful in combating fatigue in cancer patients.

On the other hand, these findings are in disagreement with the results by **Nicole (2011**) who found that conducting a comprehensive rehabilitation program for women exercise sessions that included aerobic, resistance and flexibility training. Along with an exercise component, the participants received a baseline patient assessment, nutrition counseling, physical activity counseling, and social support. Results did not reveal a significant decrease in fatigue of participation in physical activity, due to the small sample size. Also, **Ali (2004)** found that no reduction in the fatigue severity after implementation of the nursing management protocol for the study group.

The results of the present study revealed that there was a positive correlation between patient's fatigue and patient's age post program and follow up. This means that young females tend to have less fatigue level post program and at follow up. These findings are in agreement with the results by **Varvaro et al. (1996)** who concluded that, older women with myocardial infarction had a higher level of fatigue than younger women.

In contrast to this, **Winters-Stone et al. (2008) and Reuter et al. (2006)** who found that fatigue was inversely related to age. Also, **Ali (2004)** and **Gameel (1999)** found that there was no correlation between age and level of fatigue as measured by Fatigue Severity Scale.

The postoperative period is often characterized by upper body pain, as well range of motion limitations (**Mercer 2008**).Lymph nodes dissection may result in a deterioration of postoperative function, frequently described as symptoms of decreased shoulder and arm mobility, strength, pain, decreased range of motion, and muscle weakness, seroma and lymphoedema (**Kozanoglu & Basaran, 2009; Clark et al., 2005**). These symptoms can lead to permanent dysfunction of the arm and difficulties with daily activities ranging from overhead reaching and carrying objects to caring for family and returning to work (**Ebaugh, et al., 2011**; **Omar et al., 2011**; **Forchuk, et al., 2004**).

Post mastectomy exercise plays an important role in releasing muscular tension, preventing scar tissue development and restoring strength and flexibility to joints and muscles that have been affected by the surgery(**Mercer 2008**).To reduce the impairment of strength and mobility and to avoid lymphoedema, shoulder exercises are commonly prescribed (**Gautam et al., 2011; Smeltzer, et al., 2008; Linton, 2007**).

The results of the present study revealed that there was statistical significance difference between the study group and control group in relation to SPADI scores ($p < 0.001$). This means that the study group attained shoulder function more than the control group, post program and after one month of implementation of the educational program. In turn, this means that arm and shoulder exercises which were taught are effective exercises, if they are practiced regularly by motivated patient.

These findings are in agreement with **Cantarero-Villanueva et al. (2011**) who found that an 8-week supervised multimodal physical therapy program, including core stability exercises, endurance exercises, neck-shoulder mobility procedures, relaxation interventions and manual massage, exerts broad effects in BCS. These findings are also in agreement with **Silverman (2010)** who reported that exercises would prevent swelling, tightness and they should relieve discomfort and promote healing. In the same line, **Grimsey (2010)** reported that the woman should be shown arm exercises to prevent a frozen shoulder, prevent lymphedema, and keep her arm flexible. The nurse should give the patient written, illustrated instructions on how to do exercises **(Breastcancer.org, 2012).**

In the same point, **Fung et al. (2011)** concluded that physiotherapy program was proved to be safe and effective on improving shoulder function without major complications. In addition, pain management, postural advice, physical activity advice and lymphoedema control was incorporated in the program. After the program, Numeric Pain Rating Scale (NPRS) and SPADI were significantly reduced. With proper exercise, full range of motion returns; both arms can be extended fully and equally high over the head. The woman benefits from having something active to do to help herself during the difficult period of adjustment after mastectomy. Many activities of daily life provide good exercise, such as reaching high shelves, hanging clothes, and gardening (**Mosby's Medical Dictionary, 2008**).

These findings are in consistent with **Bendz & Olse´n (2002)** who concluded from their study that in both short as well as long term, early onset of exercises is valuable in avoiding deterioration in range of shoulder motion. In the same line, **Jansen, et al. (1990)** who found that shoulder mobility returned to preoperative values faster with early onset of exercise although only minor differences are seen in the long term.

Gautam et al.,(2011) emphasized that several therapies have been used and tried to treat lymphedema, but rehabilitative interventions remain the treatment mainstay and exercises play an important role in such rehabilitation, to prevent dysfunction following surgery and to prevent or treat long-term arm lymphedema **(Shamley et al., 2007;**

Latimer & Ginis 2005; **McKenzie & Kalda, 2003; Bendz & Olsén, 2002).**

These exercises are aimed at stretching muscle and restoring/maintaining range of shoulder motion (**ACS 2009**; **Lewis et al., 2007**). Such exercises should be started from the early stages after breast surgery (**Bendz & Olsén, 2002**) and practiced regularly for best outcomes and quality of life (**Damush et al. 2006**; **Campbell et al. 2005**; **Turner et al. 2004**). **Shamley et al. (2007**) and **Shamley et al. (2005**) emphasized that arm and shoulder exercises should be widely taught to patients with breast cancer during hospitalization before mastectomy.

In the same harmony, **Pender et al. (2006**) and **Brown** (**2005**) noted that to enhance the effects of arm exercises and prevent shoulder dysfunction and arm edema, patients need to be motivated to use and maintain arm exercises. This motivation is influenced by patient factors known as 'arm-exercise promoting factors, which clinicians need to identify and assess. Based on the Health Promotion Model, previous studies have revealed that perceived benefits, learning support and situational support were reported to be related to exercise behavior (**Cheng et al., 2010**).

In this study the patients were motivated to use and maintain arm and shoulder exercises through teaching the benefits of the exercises, which in turn, motivated them to apply and adhere to regular exercise, learning support by the researcher and effective learning materials (booklet, poster), and family support while exercising, all contributed the patients to compliance with the exercises program. In the same line, **Mohamed** (**2009**) reported that a predictor of positive adjustment included good family support, which plays a crucial role in facilitating patient's ability to make life decisions and actively participate in self-care. These signify that strong family and social ties among Egyptians could be also a main contributor.

Also, the results of the present study showed that there was a positive correlation between SPADI scores and patient's age post mastectomy and after one month. This means that older women suffered from shoulder dysfunction more than younger ones, after one month post mastectomy. This finding is in agreement with **Mohamed (2009)** who found that advanced age was the main factor affecting on physical conditions.

Conclusion and Recommendations

The study concludes that the educational program regarding therapeutic exercises have a significant positive impact on women's information and practice regarding decreasing of pain, fatigue and shoulder disability in the study group than control group. This success is attributed to that the educational program is based on needs assessment and integrates updated technology. Therefore, this educational program should be adopted as an essential component of the care provided to mastectomy patients. Continuous follow-up together with selecting the optimal treatment options for each individual patient are recommended. The long-term effects of following the educational program need to be further studied. Pre-service and in-service training program for the purpose of refreshing and updating the knowledge and practice of the nurses working with oncology surgical patients, who should be followed by continuous evaluation. An increase of nurses' awareness regarding the effect of relaxation technique upon patient's physical and psychological condition; conducting workshops, seminars, or clinical conferences regarding the presence issue could help immensely.

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