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The Effect of Arm Exercises on The Prevention of Lymphedema in Post-Mastectomy Breast Cancer Patients at Haji Adam Malik Medan Hospital

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*Abstract:***Breast cancer is a malignant neoplasm, an abnormal growth of breast tissue that does not see the surrounding tissue, grows infiltrative and destructive, and can metastasize. Every breast cancer patient experiences side effects from various treatment treatments. This is because the therapy that each patient gets varies and also that cancer sufferers have different genetic backgrounds and different environments. Mastectomy in breast cancer patients can cause many patients to suffer from decreased joint mobility, lymphedema, and limitation in daily activities. These complaints can be overcome with arm exercises. Arm exercises are done to improve circulation and muscle strength and to prevent joint stiffness, preventing lymphedema from occurring. The purpose of this study was to analyze the effect of arm exercises on lymphedema prevention by looking at the value of arm measurements before the intervention and after intervention in the intervention and control groups. The research design was a quasi-experimental study with a total sample size of 32 respondents per group so that the total sample was 64 respondents. The research results were based on the t-test. The independently obtained p=0.001, namely p <0.005, which means that there was a significant effect of the arm measurement value on post-mastectomy breast cancer. It is hoped that this study can be used as education for post-mastectomy patients to improve the lymph flow so that lymph flow obstruction does not occur.**

Keywords:Breast cancer, Mastectomy, Lymphedema, Arm exercises

1. INTRODUCTION

Breast cancer is a malignant neoplasm, an abnormal growth of breast tissue that does not see the surrounding tissue, grows infiltrative and destructive, and can metastasize. Breast tumors grow progressively and enlarge relatively quickly. Cancer is a disease with multifactor causes that is formed over a long period and progresses through different stages [1]. The most commonly used procedures for the management of breast cancer are mastectomy with or without reconstruction and surgery combined with radiation therapy [2]. Mastectomy is the surgical removal of breast tissue [3]. The scope of the resection includes the entire breast, skin, pectoralis major and minor muscles, axillary lymph nodes including internal mammary or supraclavicular depending on the type of surgery or mastectomy performed [4].

There are several types of mastectomy performed on breast cancer patients that can cause lymphedema according to Andrews [4] (2010), namely radical mastectomy, radical modified mastectomy (mastectomy patey), and simple or total mastectomy. Total mastectomy with axillary lymph node dissection can have several sequels including lymphedema post-mastectomy [5]. If lymphedema occurs, its spread is related to the number of colorectal lymphatic channels removed during surgery. Patients need information about possible

postoperative surgical edema and strategies to prevent it. Scratches, bruises, and infection at the operated site increase the likelihood of lymphedema [6]. Lymphedema also predisposes patients to the development of infection, decreased functional ability, and range of motion [7].

Complaints experienced as a result of the mastectomy can be resolved by carrying out various ambulations. Ambulances are allowed when the patient is free from anesthesia and can tolerate fluids. Arm exercises in breast cancer can reduce clinical symptoms of breast cancer post medical therapy, patients who practice regularly get a reduction in post-therapy clinical symptoms (lymphadenopathy, fatigue, pain, nausea), and also if these symptoms arise then the severity is not as high as if they don't practice regularly [8].

Arm exercises are the key to improving body condition. It is also used as a therapy to form deformities or to restore the whole body to a state of maximum health so that there will be physiological changes in the body system [9]. Post-mastectomy side effects must be overcome by doing arm exercises. According to Toglia[10], there is a fact that postoperative arm exercises can reduce the risk of lymphedema and shoulder stiffness and inhibit symptoms such as weakness, muscle atrophy, bone pain, and decreased metabolism.

2. METHODS

The study was a quantitative study with a quasi-experimental design approach. The study conducted pre-test measurements in all groups, both the intervention group and the control group. Furthermore, in the intervention group according to the planned protocol, while in the control group there was no intervention. The quasi-experimental design used was a form of treatment group A (arm exercises) and group B control. Univariate analysis was carried out using descriptive analysis through the distribution of frequency and percentage of data including age, education, occupation, and data on arm measurements before the intervention and after the intervention on both treatment and control group respondents.The first bivariate analysis was carried out by the data normality test with the Kolmogorov-Smirnov data with a normal distribution where the p-value> 0.005. Then the paired t-test was conducted to test the mean difference between the same 2 groups (pre-test and post-test). Then the Independent t-test was carried out to see the mean of the 2 different groups.

3. RESULTS

Based on the results of the study, more than two thirds (78.12%) in the intervention group were in the middle adult age range (41-60 years) with an average age of 49.91 years (SD=9.623). Whereas in the control group the majority of respondents (87.5%) were middle adults (41-60 years) with an average age of 52.97 years (SD=6.453). Based on education level, half (50%) of the intervention group had a high school/equivalent graduate education. Whereas in the control group more than half (53.12%) of education had graduated from high school/equivalent. Based on the level of employment, more than half (52.12%) of the intervention group worked as self-employed, while in the control group more than half (62.5%) were self-employed.

Table 1: Distribution of Frequency and Percentage of Demographic Data Characteristics of Post-Mastectomy Breast Cancer Patients

		Intervention		Control	
Variable	Kategori	f	%	f	%
Age	18-40 years (early adulthood)	4	12,8	1	3,12
	41-60 years (middle adult)	25	78,12	28	87,5
	>60 years	3	9,37	3	9,37
Education	Primary school	4	12,5	3	9,37
	Junior high school	7	21,87	2	6,25

	Senior high school/equivalent	16	50	17	53,12
	College	5	15,62	10	31,25
Employment	Self-employment	17	52,12	20	62,5
	Civil officer	2	6,25	6	18,75
	Farmer	5	15,62	3	9,37
	Private company	2	6,25	-	-
	No worked/housewife	6	18,75	3	9,37

The results showed that breast cancer patients after mastectomy at Haji Adam Malik Hospital Medan in the majority control group (87.5%) had lymphedema and less than a quarter (12.5%) did not experience lymphedema.

Table 2: Frequency Distribution with Lymphedema and No Lymphedema After Arm Exercises in Post-Mastectomy Breast Cancer Patients

Group	Lymphedema		No Lymphedema	
	f	%	f	%
Intervention	0	0	32	100
Control	28	87,5	4	12,5

Table 3: Results of Analysis of the Effect of Arm Exercises on Lymphedema Prevention by Seeing the Value of Arm Measurement Before Doing Arm Exercises and After Doing Arm Exercises in Post-Mastectomy Patients in the Control Group and the Intervention Group

Arm size (cm)		Control		Intervention			
		Mean±SD	t	p-value	Mean±SD	t	p-value
Upper arm	*Pre-Post*	2,531±0,761	-18,808	0,001	4,031±1,448	15,752	0,001
Forearm	*Pre-Post*	2,219±0,706	-17,768	0,001	4,094±1,279	18,108	0,001
Wrist	*Pre-Post*	1,688±0,859	-11,113	0,001	3,188±1,355	13,312	0,001
Hand	*Pre-Post*	2,063±0,716	-16,304	0,001	3,406±1,160	16,610	0,001

Table 4: Results of Independent t-test analysis of post-test intervention group and control group post-test in post-mastectomy patients in the control group and the intervention group

Arm size (cm)	Mean difference ± SD	95 % CI	t	p-value
Upper arm	4,063 ± 3,614	5,451 ±2,674	-5,874	0.001
Forearm	7,531 ±2,348	8,505 ±6,558	-15,462	0.001
Wrist	4,531 ± 1,866	5,319 ± 3,744	-11,502	0.001
Hand	4,500 ± 1,930	5,354 ±3,646	-10,535	0.001

4. DISCUSSION

Based on the results of arm measurements before doing arm exercises in the two groups, namely the control group and the intervention group, the results of the measurement of the arm before the intervention was not so different in the two groups because there was no exercise and the measurement was carried out one day after post-mastectomy. According to research by Dennis [11] states that lymphedema in the arm will be seen more than 48 hours post-mastectomy if the patient does not do arm mobilization or arm movements. There is an increase in the accumulation of fluid in the lymph because of the lymph node removal factor. So patients who have had a mastectomy have to do exercises on the affected arm. The results of this study are in line with the research of Gautam, [12] which states that pre-intervention that does not get any exercise cannot be assessed for the incidence of lymphedema because the initial measurement is only to see the value of the arm size in each arm to be measured.

Exercises in the intervention group helped post-mastectomy patients to restore range of motion, maintain muscle tone, and improve blood and lymph circulation [13]. Based on the results of the study, the researcher saw a significant difference according to body weight in

the pre and post-intervention arm sizes of the intervention group and the control group. Based on the research of Gautam[12], the value of arm size in the control group and the intervention group will be very different, influenced by the training given to the intervention group. Dell's [13] study stated that the increase in arm size after a mastectomy is influenced by several factors, namely the removal of the lymph nodes, lack of movement exercises in the affected arm, and the effect of infection. The results of Dell's [13] study regarding the range of arm exercises in post-mastectomy breast cancer patients obtained results from 94 respondents who participated in post-mastectomy arm exercises, the majority (90.2%) of respondents avoided lymphedema.

5. CONCLUSIONS

The majority of lymphedema incidence in the control group (87.5%) had lymphedema and (12.5%) did not have lymphedema. The intervention group lymphedema did not occur. The results of this study can be concluded that there is an effect of arm training on lymphedema prevention in post-mastectomy breast cancer patients with a significant value of p=0.001.

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