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Original Article

Effect of relaxation modification on pain of breast cancer patients undergoing mastectomy: pilot study

Tetti Solehati[1]*, Cecep Eli Kosasih[2], Suryani Kaprudin[3]

[1] Maternity Departement - Faculty of Nursing, Universitas Padjadjaran, Jl Raya Bandung –Sumedang KM 21, Sumedang, West Java, Indonesia. [2] Critical Care Nursing Departement -Faculty of Nursing, Universitas Padjadjaran, Jl Raya Bandung –Sumedang KM 21, Sumedang, West Java, Indonesia. [3] Mental Health Departement -Faculty of Nursing, Universitas Padjadjaran, Jl Raya Bandung –Sumedang KM 21, Sumedang, West Java, Indonesia.

Correspondence: Tetti Solehati, Faculty of Nursing, Universitas Padjadjaran, Jl Raya Bandung –Sumedang KM 21, Sumedang, West Java, Indonesia, Email: tetti.solehati@unpad.ac.id

ABSTRACT

Background & purpose: Patients who underwent mastectomy will experience pain due to trauma surgery if this pain is allowed it will cause complications in the patient and will cause hospitalization time to become longer. The cause of the pain can not be eliminated, but the sensation of pain can be reduced with pain management, both pharmacological and non-pharmacological or nonpharmacological therapies. The purpose of this study was to investigate the effect of Relaxation Modification on the Pain of Breast Cancer Patients Undergoing Mastectomy Methods: This quasi-experiment with one-group, pre-test, and post-test design were used in this pilot study. The sampling technique used the nonprobability of 15 people using consecutive sampling with criterion. Participants received the RM for 4 days every 12 hours in 10 minutes. The outcome measure was the visual analog scale (VAS) scores for pain before and after the intervention. Results: The results showed that there was a significant difference ($p < 0.001$) in the mean intensity of pain before and after the intervention period of relaxation modification. Conclusions: Relaxation modification intervention significantly decreased pain.

Keywords: Aromatherapy, Benson, Mastectomy, Pain, Relaxation Modification

Introduction

Breast cancer is one of the most common cancers that has a major impact on the health of women worldwide [1, 2]. It is found in Indonesia in the first place with a relative frequency of 18.6%. It was estimated that the incidence was 12/100,000 women, and more than 80% of cases were found to be at an advanced stage [3]. One of the treatments for breast cancer is mastectomy, which is removing the interior breast mound, areola, nipple, as well as a wide margin of tissue around the incision [4, 5].

The mastectomy has physical-psycho-social impacts on the patients [6]. The physical impact is pain that is described as something detrimental and distressing experience [7-9]. 75% of the patients experience moderate to severe pain after surgery with the duration of pain lasting 24 to 48 hours but can also last longer depending on how the patient can withstand and respond to the pain [10]. Other studies mentioned that women experience high levels of pain during the first 24 hours post-surgery [11].

Pain will cause discomfort if not treated immediately and can cause harmful effects, such as disruption of the healing process that affects the length of stay, impaired mobility, sleep disturbance, loss of appetite, risk of thromboembolism, impaired daily life activities, physical disability, psychological distress, and helplessness [12-18].

Adverse effects on the patient due to pain caused various attempts to overcome the pain, both with pharmacological and

Access this article online	
Website: www.japer.in	**E-ISSN:** 2249-3379

How to cite this article: Tetti Solehati, Cecep Eli Kosasih, Suryani Kaprudin. Effect of relaxation modification on pain of breast cancer patients undergoing mastectomy: pilot study. J Adv Pharm Edu Res 2020;10(3):62-67.
Source of Support: Nil, Conflict of Interest: None declared.

non-pharmacological approaches. One of the non-pharmacology approaches is relaxation [18]. Several studies have shown that relaxation is effective in reducing postoperative pain [19-21]. One relaxation technique that is simple, easy to implement, and does not require a lot of money is the Benson Relaxation (BR) technique, where relaxation is a combination of relaxation response techniques with individual belief systems/faith factors (focused on certain expressions like in the name of God, or words that have a calming meaning for the patient) that was said repeatedly with regular rhythm accompanied by resignation [22]. A study conducted on post-cesarean mothers in hospital sections in Indonesia showed that Benson Relaxation had an effect on reducing pain [23].

Besides BR, distraction techniques are also known to reduce pain intensity. One of the distraction techniques is Relaxation Music (MR) therapy. Music can provide the effect of reducing pain, in addition to providing effects for improving health and reducing stress [24]. Music can create a relaxed, safe, and pleasant atmosphere, affecting the limbic system and muscular nerves, thereby stimulating the release of gamma-aminobutyric acid (GABA), encephalin, and beta-endorphins that will eliminate pain neurotransmitters. Harp music, soft flute, and instrumental will give a calming effect [25], which can indirectly reduce pain. Research on women with post-mastectomy, patients undergoing cardiac surgery, and pain patients due to Coronary Angiography has proven that music therapy was effective in reducing pain [26-29].

Besides the BR and MR, aromatherapy is also known to be effective in reducing pain. Aromatherapy is a method in which essential oils are used to improve physical, emotional, and spiritual health. Essential oils have several effects one of which is reducing pain [7]. Several studies have proven that aromatherapy is effective in reducing pain. Aromatherapy is effective in reducing arthritis pain and postoperative pain [30,31]. Lavender Aromatherapy has been shown to reduce headache, post-op Caesarean section pain, tonsillectomy pain, and needle insertion pain [32-34]. Aromatherapy Eucalyptus is effective in reducing headache [35].

In addition, BR, MR, and AR have different physical and psychological effects, such as stress, health, emotional, and spiritual improvements, which in turn lead to decrease in pain, so it is likely to be even better if the three relaxations are combined with Relaxation Modification to cause a better pain reduction effect. The effect of the combination of these three relaxation methods on reducing post-mastectomy pain has not been examined. The effect of several combined complementary therapy interventions is better than complementary therapy alone. With the combination of physical and psychological dimensions of intervention, more effectiveness will be achieved, whereby each of these interventions can compensate for each other's deficiencies and add strength to each other [36]. Therefore, the purpose of this study was to investigate the effect of Relaxation Modification on pain of breast cancer patients undergoing mastectomy.

Material and Methods

A quasi-experimental, repeated measures design of two groups was used to examine the effects of the effect of relaxation modification on pain of breast cancer patients. The total number of respondents in this study was 19, but 4 patients experienced drop out (DO) so, 15 people became respondents. They enrolled using consecutive sampling with inclusion criteria including willing to be a respondent, got ketorolac therapy, compos mentis, able to hear, able to smell odors, had never received relaxation therapy, music therapy, and aromatherapy before. While exclusion criteria were: awareness under compos mentis, and not willing to be a respondent. The study was conducted at RSHS Bandung from 1 October to 14 December 2013. The research instrument consisted of (1) demographic data (age, education, occupation, level of education) and (2) Pain scale: Visual Analog Scale (VAS). This scale was in the form of a horizontal line along the 10 cm, where the left end identifies no pain and the right end indicates severe pain. This scale can be perceived as follows: 0 = no pain, 1-2 = mild pain, 3-4 = moderate pain, 5-6 = severe pain, 7-8 = very severe pain, 9-10 = bad pain until no bearable [37]. Participants received RM for 4 days every 12 hours for 10 minutes. The outcome measure was visual analog scale (VAS) scores for pain before and after the intervention. The demographic and socioeconomic information about the respondents were analyzed by the descriptive statistic (frequency, percentage, mean, and SD). Repeated Measures ANOVA (RM-ANOVA) was used to test the differences in the mean scores of relaxation modification of the experimental groups. Independent *t*-test was used to compare the differences of the mean scores of relaxation modification measured at Time 1, Time 2, Time 3, Time 4, Time 5, and Time 6 among patients who received the relaxation modification.

Results and Discussion

1. Characteristics Respondent

Table 1: Distribution of respondent characteristics (n = 15)

No	Variabel	Intervention (n=15)	
		f	%
1.	Age		
	18-39 years	2	13.3
	40-60 years	13	86.7
2.	Education		
	Elementary school	8	53.3
	Primary school	5	33.3
	High school	2	13.3
3.	Occupation		
	Employee	0	0
	Unemployed	15	100

Based on Table 1, the majority of respondents (13 people, 86.7%) aged between 40-60 years, the majority of respondents (8 people 53.3%) were elementary school educators, and all of them (15 people, 100%) were unemployed.

2. Relationship between Respondent Characteristics and Pain Intensity

The difference in average pain intensity was tested to find out the characteristics of respondents influenced by the intensity of pain. The test used was an independent *t*-test, because the data to be tested was numerical and categorical. The following will describe the relationship of the respondents' characteristics with pain intensity

Table 2. Relationship between the respondents' characteristics and pain intensity before intervention (n = 15)

No	Variable	Pain intensity			
		f	*Mean*	*SD*	*p*
	Age				
1.	18-39 years	2	7	4.24	0.552
	40-60 years	13	6.06	1.94	
	Education				
2.	Low	8	6.63	1.768	0.432
	Moderate	7	5.71	2.563	

Based on Table 2 the mean pain intensity in respondents aged 18-39 years was 7.00 cm, while at the age of 40-60 years it was 6.06 cm. The results of the analysis found that there was a significant difference between the intensity of pain and age (p = 0,552: α = 0.05). Then the average pain intensity in respondents with low education was 6.63 cm, while in further education it was 5.71 cm. The results of the analysis found no significant difference between education and pain intensity (p = 0.432; α = 0.05).

3. Distribution of respondents according to pain intensity

Table 3. Distribution of respondents according to pain intensity pre-intervention 1 to post-intervention 6 (n = 15)

Variable	N	Minimum	Maximum	Mean	Std. Deviation
Pre intervention 1	15	3	10	6.20	2.145
Post intervention 1	15	1	7	4.07	1.944
Post intervention 2	15	0	7	3.33	2.257
Post intervention 3	15	0	6	3.47	1.807
Post intervention 4	15	0	5	2.53	1.552
Post intervention 5	15	0	5	2.13	1.598
Post intervention 6	15	0	3	0.73	1.100

Table 3 shows that of the 15 intervention samples, the average pain intensity showed a decrease in the mean values. The highest mean value of pain intensity was pre-intervention 1, which was 6.2 and the lowest mean value of pain was intensity post-intervention 3, which was 0.73.

4. The Mean Intensity of Post Mastectomy Patient Pain Before and after the Intervention Period

Table 4. Distribution of respondents' mean pain intensity before and after the intervention (n = 15)

Groups	f	Modus	Minimum	Maximum	Mean	SD
Pre-intervention	15	3	1	10	6.20	2.145
Post-intervention	15	2	1	5	2.71	1.401

Table 4 shows that there were differences in the average pain before and after the intervention. Before the intervention, the mean pain value was 6.20 cm, which decreased to 2.71 cm after the intervention. The difference between the decrease in pain between before and after the intervention was 3.49 cm.

5. Difference in the mean pain intensity before and after the intervention period

To determine the effect of the Relaxation Modification intervention, it was necessary to know the difference in the average pain intensity before and after the intervention period. Because the data was taken repeatedly 6 times to see the difference between them using ANOVA repeated measures. The following Table shows the difference in mean pain intensity.

Table 5. Sphericity Test of Pain intensity before and after the intervention period

Within Subjects Effect	Mauchly's W	Approx. Chi-Square	df	Sig.	Epsilon(a)		
					Greenhouse-Geisser	Huynh-Feldt	Lower-bound
factor1	.003	67.915	20	.000	.427	.532	0.167

Table 5 shows that the sphericity test results were significant (p = 0.00; α = 0.05).

Table 6. Tests of Within-Subjects Effects of Pain intensity before and after the intervention period

Source		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Observed Power (a)
factor1	Sphericity Assumed	262.590	6	43.765	30.935	.000	.688	1.000
Error (factor1)	Sphericity Assumed	118.838	84	1.415				

a Computed using alpha = 0.05

Table 6 shows that the results of tests within-subject effects by looking at the sphericity assumed were significant namely F (6,

84) = 30,935, p = 0,000. From these results, it can be concluded that there was a significant difference in the mean pain relief from the relaxation intervention before and after the relaxation modification. Because there were significant differences, post hoc was conducted to see the difference in the mean of each intervention pair.

Table 7. Post hoc analysis of pain intensity

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	SD	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Pre1 - Post1	2.133	1.959	.506	1.048	3.218	4.217	14	.001
Pair 2	Pre1 - Post2	2.867	2.031	.524	1.742	3.991	5.467	14	.000
Pair 3	Pre1 - Post3	2.733	2.404	.621	1.402	4.065	4.403	14	.001
Pair 4	Pre1– Post4	3.667	1.633	.422	2.762	4.571	8.696	14	.000
Pair 5	Pre1– Post5	4.067	1.223	.316	3.390	4.744	12.880	14	.000
Pair 6	Pre1– Post6	5.467	1.506	.389	4.633	6.300	14.063	14	.000

From Table 7, it can be reported that the results of paired samples test showed a significant difference between the pre-intervention and post-relaxation intervention (p = 0.00; α = 0.05).

Discussion

The results showed that the mean pain intensity after mastectomy before the intervention period was in the category of severe pain (6.20 cm). Post-section pain is moderate and severe pain that 75% of surgical patients experience it [10].

The results of this study found that the RM intervention given to post-mastectomy women decreased pain intensity and the results of the bivariate analysis showed a significant difference in the average decrease in pain intensity before and after RM intervention (p=0.001). The administration of RM interventions can reduce pain intensity from 6.20 cm to 2.71 cm. This happens due to the mutually reinforcing cooperation of the three relaxation techniques (BR, MR, and AR) used in RM interventions where each of these interventions can compensate for each other's shortcomings and add strength to each other [36]. Benson Relaxation reduces anxiety and relieves pain by decreasing sympathetic nerve cooperation and increasing parasympathetic nerve actions [22]. These nerves work in synergy with the limbic system and muscular nerves produced by Relaxation Music to eliminate pain neurotransmitters. The works of the parasympathetic nerves, sympathetic nerves, and limbic system synergize with the thalamus, which is stimulated by the odors of Aromatheuraphy to increase the effectiveness of pain relief. Based on research at the University of Warwick in England, the odor produced from aromatherapy binds to a steroid group in the sweat gland called osmon, which has the potential as a natural chemical sedative that stimulates the brain neurochemistry. A pleasant odor stimulates thalamus to release encephalin, which functions as a natural painkiller and produces feelings of well-being [38]. Encephalin, like endorphins, is an endogenous chemical (produced by the body) that has a structure similar to opioids [39].

The combination of relaxation has been shown to be effective in reducing pain. Systematic Review and Meta-Analysis research on aromatherapy found that aromatherapy successfully treated pain when combined with conventional treatments [40]. Research combining relaxation therapy and music in its intervention found that the combination is effective in reducing pain [20]. A study on the combination of music and nature sounds in post-op cardiac surgery patients showed a significant decrease in pain scores [41]. The combination of Benson Relaxation research and brief psychoeducational intervention has been proven to be effective in reducing multidimensional pain in pregnant women[36]. The results of the combined study were strengthened by research on the effects of non-pharmacological pain management strategies on post-op coronary artery bypass graft patients in 20 samples where all patients used nonpharmacological interventions to reduce pain intensity, which included deep breathing, massage, distraction, and repositioning. In this study, it was found that the group that received pharmacological therapy combined with spiritual intervention showed more pain reduction than the group that received pharmacological therapy alone [42].

Conclusion

The many problems experienced by women breast cancer patients undergoing mastectomy lead to the need for the pharmacologically and non-pharmacologically management of pain. The incorporation of Relaxation Therapy (Modifications Relaxation) is needed to increase the effectiveness of reducing pain experienced by patients. Relaxation Modification has an effect on reducing post-mastectomy pain.

Acknowledgment

We would like to extend our gratitude to the Rector of UNPAD and the Director of Research and Community Service of UNPAD who has funded this research through the Hibah Kompetensi scheme, as well as to express appreciation to all patients participated in the study.

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