Five-Finger Relaxation Technique on Fatigue and Pain of Breast Cancer Patients

Rosliana Dewi, Laili Rahayuwati, Titis Kurniawan

ABSTRACT

Fatigue, and pain are symptoms most often found on breast cancer patients. To overcome them, the five-finger relaxation technique is considered effective. This research aims at identifying its effects on fatigue and pain of breast cancer patients. The method of this research applies the quasi-experiment. The population comprises breast cancer patients benefiting from healthcare services at Hospital. The sampling was done by consecutive sampling-both the control and the intervention groups have 30 members. The intervention group received the standard therapy from the hospital and a 15-session five-finger relaxation technique for 10-15 minutes, every other day, for the duration of a month. The measurement tools were FACIT, and BPI. The analysis used Paired Sample t-Test and t-Independent Test. The result of the research shows a difference in scores of pre-test and post-test fatigue and pain in both control and intervention group due to p value < 0.05. There is a score difference in the two symptoms between control and intervention group, with the former having lower scores than the latter. This research concludes that there are effects of five-finger relaxation technique on the fatigue, and pain of breast cancer patients.

Keywords: fatigue, breast cancer, pain, five finger relaxation technique

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I.   INTRODUCTION

Breast cancer is the most often diagnosed cancer and the main cause of cancer-related death for women in the world. From 23% cancer cases in total, 14% of which are of breast cancer. Moreover, around 1.15 million patients were diagnosed invasive breast cancer every year, causing 40 million more women to die [1]. In 2013, the Basic Health Research claimed that breast cancer prevalence in Indonesia reached 0.5 per 1000 women. More than 80% cases in Indonesia were found to be in advanced stage, where efforts of treatment were quite a challenge. On the other hand, West Java is the region with the third-highest number in breast cancer cases (6.701 patients with 0.3% prevalence).

Breast cancer may affect some aspects of the patient such as that of physical (fatigue, pain, sleeping disorder), psychological (anxiety and depression), social (feelings of isolation and frustrated over medical debts) and spiritual (guilt and stuck in the state of acceptance and denial) [2,3]. The accumulation of these problems may impair the patient's life condition [4].

The implementation of breast cancer is done through a series of treatments. The most popular ones include surgery, chemotherapy, hormonal therapy, radiational therapy and/ or a combination of all methods. Although it may recover the patient's condition, the therapy has its own side effects and a series of physical and psychological symptoms [5]. In extreme cases, these conditions even hamper the patient's ability to even follow medical protocol, perform daily routines, and maintain conventional life standards [6].

Some of the most reported symptoms due to cancer and its treatment include fatigue, pain, sleeping disorder, loss of physical abilities, sarcopenia, cachexia, and complications.[5] Out of all, the first 2 symptoms, interconnected and likely to occur simultaneously, are the most frequent occurrence among breast cancer patients [7].

Fatigue is a common symptom among breast cancer patients. Cancer-related fatigue (CRF) is caused by psychological disturbance for the patient. Most of the patients are incessantly exhausted for 10 years after being first diagnosed [5]. The impact of fatigue to the patients lowers the life quality, limiting personal or social activities. Some research also show that fatigue may have more negative impacts than any other symptoms, including nausea, pain, and depression [8].

Another common symptom among breast cancer patients is pain, known to weaken the patient. It includes post-surgical pain, breast pain, and chemotherapy- and radiation-related pain [9]. Cancer-related pain contributes to depression, insomnia, and the lowering of life quality to most cancer patients [10].

The management of the two symptoms is, thus, paramount. Two of them include pharmacology and non-pharmacology that involve *Cognitive Behaviour Therapy* (CBT), and they are considered effective to tackle problems such as fatigue, and pain [6,11,12].

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CBT is a short-term therapy (12-20 sessions) that emphasizes on the importance of the patient's way of thinking to determine their emotions and actions. It stands on the belief that any thoughts may strongth effect their one's emotion and behavior [13].

One of the applicable CBTs is the relaxation technique. It creates a relaxing condition on the autonomous nervous systems, which leads to the normalization of blood supply in muscles and lower the consumption of oxygen, heartbeat, respiratory system, and muscle activities [14]. Types of relaxation include autogenic training, progressive training and meditation [15].

One of the autogenic training techniques used to overcome psychological disorder is the five-finger relaxation technique. It is a process taking into account the strength of mind by encouraging the body to self-heal, maintain health, and relax through inward communication involving all perceptions [16]. Smeltzer & Bare advocate that this technique is useful to overcome anxiety in patients. Through guided imagination, they will create visualizations that will enlighten their mood [17].

The five-finger relaxation technique, however, has not been applied as an alternative intervention to handle breast cancer patients in hospitals, as it is apparent at Sekarwangi Hospital and R. Syamsudin SH Hospital, Sukabumi West Java Province. That said, the research on the technique on fatigue and pain is based on its implementation at the hospitals mentioned.

II. LITERATUR REVIEW

Women who suffer from breast cancer experience symptoms especially fatigue and pain. The symptoms experienced are known as Symptoms of Clusters [6,7]. Some studied showed psychosocial interventions such as relaxation can be recommended to reduce CRF. Relaxation techniques have the potential to deal with cancer-related symptoms including CRF. Several randomized controlled trials have recently shown that relaxation causes significant improvements in fatigue in breast cancer patients [18].

The nonpharmacological approach that is commonly done in efforts to deal with pain is through psychological pain modulation approaches such as relaxation and through sensory modulation of pain such as massage and acupuncture.

The five-finger relaxation technique is a process that uses the mind to move the body to heal itself and maintain health or relax through communication in the body that involves all the senses including touch, smell, vision and hearing [16]. Intervention of relaxation techniques can significantly reduce the level of fatigue in cancer clients. Research of cancer patients who were given guided imagery interventions showed that patients had significantly decreased fatigue levels [19]. Research by Nugroho also shows that the five-finger relaxation technique significantly influences the reduction in the level of fatigue in breast cancer patients [14].

Five-finger relaxation techniques are very useful in reducing the intensity of pain because it can make the patient unfocused to feel pain. muscle tension and discomfort will be removed and cause the body to be relaxed and comfortable [17].

III. DATA COLLECTION

The design of the research is quasi experiment with pre-test-posttest control group design. The population in this research is all breast cancer patients accessing healthcare services in the two hospitals. The sampling technique used consecutive sampling with 60 respondents equally assigned to the intervention and the control groups. Criteria for inclusion of samples were patients who had maximum stage III breast cancer, an be invited to communicate verbally, did not have a history of chronic insomnia, did not experience Chronic Fatigue Syndrome (CFS), patients experience pain complaints with a pain scale <7, patients got analgesic therapy and independence. > 60%.

The intervention group acquired 15 session standard hospital therapy and five-finger relaxation techniques with duration 10-15 minutes per session for one month with one day interval, while the control group acquired standard hospital therapy. The measurement tools were questionnaires to measure fatigue with *Functional Assessment Chronic Illness Therapy* (FACIT). FACIT-fatigue measured fatigue from the physical, cognitive and affective dimensions and their impact on daily activities. This instrument consists of 13 questions with a 5-point Likert scale. To measured pain with *Brief Pain Inventory* (BPI). The Brief Pain Inventory (BPI) consists of 16 pain-related questions that ask about aspects of the pain experience that a patient feels over a 24-hour period, such as where the pain is located and its intensity, the impact of the pain on the patient's quality of life, as well as the effectiveness of the pain management provided. BPI takes 5 to 15 minutes to manage it, which includes 4 pain scales (current, mean, worst and finally), as well as 7 scales in assessing the impact of pain on general activities, mood, ability to walk, work, establish relationships with others, sleep and enjoyment of life. Each section is rated on a 1-10 numerical scale. The time of data sampling and experiment in this research was between 2017 and 2018.

IV. DATA ANALYSIS

Data analysis includes univariate analysis using mean values and standard deviations. Test the assumption of normality using Shapiro-Wilk. Hypothesis testing used the analysis used was Paired Sample t-Test and t-Independent Test.

A description of respondent's characteristics from the control and the intervention groups can be seen on Table 1. Based on table 1, the result of homogeneity test for all aspects of respondent's characteristic with p-value > 0.05. It means that the characteristics in both control and intervention groups are linear. The general characteristics include age above 40 years (70% and 80%), married (73,33% and 80%), unemployed (86,67%), elementary school graduates (53,33% and 60%), and stadium 1 (56,67% and 46,67%).

The descriptive result of the scores mean fatigue measured by FACIT instrument on control and intervention group can be seen on Table 2. Based on Table 2, a decrease of mean and SD of the fatigue scores in the control groups, from 38.37 (1.245) to 36.47 (1.137). It is similar to the intervention group, decreasing from 39.70 (3.153) to 35.27 (3.237). A decrease in FACIT scores occurs in both groups, indicating that the level of fatigue has lowered.

The descriptive result of the mean of pain scores measured by BPI instrument on the control and the intervention groups can be seen on Table 3.. Based on table 3, that the mean and SD of pain in the control group have decreased from 6.66 (0.182) to 5.77 (0.195). Similarly, the mean and SD in the intervention group have decreased from 6.77 (1.138) to 5.38 (0.353). A decrease in BPI score occurs in both groups, indicating that the level of pain has lowered

The mean margin of pretest and posttest was done with the score of sleeping quality using paired sample t-test, while the mean margin of the control group and the intervention was done using t-sample independent testing. The result of the analysis can be seen in the Table 4. Based on table 4, the different scores of pretest and posttest in the control group from 16.67 to 15.49 (p-value = 0.000). The intervention group also has different pre-test and post-test scores from 16.97 to 14.87 (p-value = 0.000). Both groups have improved, and the intervention group improved more significantly than the control group (p-value = 0.023).

The mean margin testing of pretest and posttest was done in the fatigue score using paired sample t-test, while the mean margin testing of the control and the intervention groups used t-sample independent. The results can be seen on Table 5. Based on table 5, a score difference in pretest and posttest in the control group from 38.37 to 36.47 (p-value = 0.000). In the intervention group, there is a score difference of pretest and posttest from 39.70 to 35.27 (p-value = 0.000). Both have improved, although the intervention has bigger arrears than the control group (p-value = 0.000).

The mean margin test of pretest and posttest was done on the pain score using paired sample t-test, while the mean margin testing of the control and the intervention groups used t-sample independent. The results can be seen on Table 6. Based on table 6, a score difference of pre-test and post-test in the control group from 6.66 to 5.77 (p-value = 0.000). For the intervention group, the score differences in pretest and posttest are from 6.77 to 5.38 (p-value = 0.000). Both have improved, although the intervention group has higher arrears than the control group (p-value = 0.016).

V. RESPONDENT CHARACTERISTICS RESULTS AND EFFECT OF FIVE RELAXATION TECHNIQUES ON FATIGUE AND PAIN

Table 1 Homogeneity Test of Respondent's Characteristics in Intervention and Control Group

Characteristics	Group				χ2	p
	Intervention		Control			
	F	%	f	%		
Age						
≤ 40	9	30	6	20	0,8	0,371
> 40	21	70	24	80		
Marital Status						
Married	22	73,33	24	80	0,373	0,542
Not Married	8	26,67	6	20		
Occupation						
Employed	4	13,33	4	13,33	0,001	1
Unemployed	26	86,67	26	86,67		
Education						
Elementary	16	53,33	18	60	0,694	0,707
Middle	14	46,67	12	40		
Duration of illness						
≤ 1 Year	24	80	22	73,33	0,373	0,542
> 1 Year	6	20	8	26,67		
Stadium						
Stadium 1	17	56,67	14	46,67	0,764	0,682
Stadium 2	8	26,67	11	36,67		
Stadium 3	5	16,66	5	16,66		

Table 2 Descriptive Result of FACIT Scores of Control and Intervention Group

FACIT Scores	n	Mean	SD
Control Group			
Pre-Test	30	38.37	1.245
Post-Test	30	36.47	1.137
Intervention Group			

Pre-Test	30	39.70	3.153
Post-Test	30	35.27	3.237

Table 3 Descriptive Result of BPI Score of Control and Intervention Group

BPI Scores	N	Mean	SD
Control Group			
Pre-Test	30	6.66	0.182
Post-Test	30	5.77	0.195
Intervention Group			
Pre-Test	30	6.77	1.138
Post-Test	30	5.38	0.353

Table 4 Testing Result of Paired Sample t-Test and t-Independent Test on the Score of Sleep Quality

PSQI Score	Mean	Paired Sample t-Test			Uji t-Independent			
		Mean Margin	t	p	Mean Arrear	Mean Margin	t	p
Control Group								
Pre-Test		1.27	5.917	0.000	1.27			
Post-Test	15.40							
						2.53	8.248	0.000
Intervention Group								
Pre-Test	16.97	2,1	7.367	0.000	2.10			
Post-Test	14.87							

Table 5 Testing Result of Paired Sample t-Test and t-Independent Test on Fatigue Score

FACIT Scores	Mean	Paired Sample t-Test			Uji t-Independen			
		Mean Margin	t	p	Mean Arrear	Mean Margin	t	p
Control Group								
Pre-Test	38.37	1.90	6.967	0.000	1,9			
Post-Test	36.47							
						2.53	8.248	0.000
Intervention Group								
Pre-Test	39.70	4.43	31.378	0.000	4,43			
Post-Test	35.27							

Table 6 Testing Result of Paired Sample t-Test and t-Independent Test on the BPI Score

BPI Scores	Mean	Paired Sample t-Test			t-Independent Test			
		Mean Margin	t	p	Mean Arrear	Mean Margin	t	P
Control Group								
Pre-Test	6.66	0,89	24,419	0.000	0,89			
Post-Test	5.77							
						0,49	6,255	0,016
Intervention Group								
Pre-Test	6.77	1,39	19,6	0.000	1,39			
Post-Test	5.38							

VI. STUDY RESULTS, SUMMARY AND CONTRIBUTION

Cancer-related fatigue is one of the most often and disheartening symptoms ever reported by breast cancer patients. Studies show that 99% breast cancer patients experience fatigue that causes significant loss in physical abilities and life quality [1,20]

In this research, a decrease in fatigue occurs in both the control and the intervention groups, with the latter showing better results than the former. In the control group, the decrease occurs due to the daily logbook filled by respondents who wrote that, during the research, they perform religious activities such as praying, remembering Allah (dzikr), reciting the Koran, and attend sermons. Praying activities somehow reduce the fatigue complaints from breast cancer patients. Furthermore, the level of concentration during praying contributes much to the success of lowering the fatigue level [21].

The intervention group, on the contrary, experiences a much more decrease in fatigue level than the control group when the technique is applied. It also gives positive impact to the fatigue level of breast cancer patients. The intervention of physical activity proves effective to help individuals adapt to physical and psychological stressors, which will lower the fatigue level [22,23]

The five-finger relaxation technique enables the body to be in a relaxed condition. The patient will then produce alpha waves that may relieve stress. Their increase during the technique will trigger parasympathetic nerves. It will prompt the patients to visualize pleasant things and allow them to concentrate, as they gradually distract themselves from their problems. Some respondents reveal that after the technique, they feel more optimistic to the current treatment they are undergoing. The process of meditation is highly impactful to the decrease of stress hormones especially Cortisol.

Anthony et al claimed that patients experiencing fatigue were given stress-management behavior therapy and had lower cortisol and higher Th1 cytokines level, with the ratio IL2:IL4. This strengthens the fact that self-composure from relaxation is a form of psychological adaption that affects the physique in decreasing fatigue level [24].

The respondent's characteristics in the research lies in the range of over 40 years old. Shimizu explains that aging will lower T cell levels as their damage will lead to the imbalance of pro- and anti-inflammatory cytokine regulation. This will complicate the treatment for breast cancer [25].

Another physical factor is the stage of breast cancer patients in response to fatigue level. This research shows that most of the respondents are in stadium 1 (56.67% in the intervention group and 46.67% in the control group). However, much worse fatigue occurs in stadium III. This finding is linear with Edward et al research, said that fatigue complaints are often heard in advanced stages of cancer. The higher the cancer stadium, the bigger the tumor size [26]. Bower & Lamkin elaborated that tumor cells were the excretion sources of pro-inflammatory cytokine mediator [27].

Pain in breast cancer may be caused by medication and metastasis from cancer cells. Van den Beuken et al reported that around 33% prevalence of cancer-related pain is due to treatment and 64% others by metastasis from cancer cells [28]. Pain-triggering cancer treatments include chemotherapy, hormonal therapy, surgery, and radiation therapy. It is a general but weakening symptom among breast cancer patients. The source of pain includes post-surgical pain, breast pain, and chemotherapy- and radiation-related pain. A research shows that 52% women with breast cancer experience pain after breast surgery [9]**.**

In this research, both control and intervention groups experience a decrease in pain, with the latter more than the former. All respondents from both groups receive analgetic therapy. Based on the daily logbook, the respondents from the control group performed religious activities such as praying, remembering Allah (*dzikr*), reciting the Koran, and attending sermons. Dzikr is highly useful to decrease pain intensity on post-surgical *ca mammae* patients besides pharmacological therapy [29]. A person experiencing pain will seek assistance to fulfill her comfort, and dzikr is one of them. It is a method that produces medical and psychological effects for the body, as it appeases the mind and the soul. Reciting the Koran may reduce pain. Not only does it activate body cells by shifting voice frictions to a complex of waves that the body identifies, but it also lowers the pain-receptor triggers so that the brain excretes natural opioids. Opioids are permanent in nature to block pain nociceptors [30].

In the intervention group, there is a more significant decrease than the control group. Besides analgesic therapy, the intervention group also receives five-finger relaxation technique. It affects the pain intensity positively, shown by its decrease as the respondent report. The technique alone is a factor that supports the success of pain decrease on breast cancer patients. The most common non-pharmacological approach by nurses to relieve pain is, first, through a modulation of psychological pain such as relaxation, hypnotherapy, imagination, biological feedback, psychoprophylaxis, and distraction. The second approach is through a modulation of sensory pain such as therapeutic massage, acupuncture, acupressure, transcutaneous electrical nerve stimulations (TENS), music, jet hydrotherapy, homeopathy, and ambulation [31].

The five-finger relaxation technique is helpful to relieve pain intensity due to imagination. This way, the patient creates visualizations that the brain identifies as a complex of stimulus. Therefore, pleasant images will appear to appease and distract patient's focus from pain. Muscle tension and discomfort will be disregarded to cause the body to be relaxed and comfortable [17].

During the research, no patient experiences any side effects. They even tend to feel relaxed, comfortable, and less in pain. This set of information shows improvement in fulfilling daily activities and decrease of dependence risk on analgesic use. This is linear with Gibson saying that one of the goals of pain management is to improve the patient's life quality, indicated by improvement of functional status such as the ability to perform daily routines, which can be achieved by minimizing side effects from the analgesics, as well as reducing negative emotions related to pain, like anxiety and depression [32]**.**

In terms of the individual's characteristic factor that affects the success of intervention, the data shows that most respondents belong to the intervention group (70.00%) and control (80.00%) in the above 40 age group. Wilkinson & Treas state that cancer risks go hand in hand with age, where diagnosis occurs on young adults and the elderly [33]. Smeltzer & Bare explain that age has a huge impact on pain [17]. Gibson & Farrel found that aging triggers change in cellular substrate and neurochemistry from nociception [30]. A meta-analysis study showed a tendency of increase in pain and decrease of tolerance limit that relate to aging. Adults sometimes report pain when it strikes pathologically and leads to a dysfunction [34]. A longitudinal research by Green & Johnson examined the effect of age on pain. The research shows that younger patients experience pain more often than the elderly [35]. A research on breast cancer also showed that patients under 40 years old experience pain more often [36].

Another successful factor is that most of the respondents were married. Somchock claimed that pain, however personal it is, may affect and be affected by people surrounding the patient [37]. Montoya et al claimed that a partner is the most important and valuable supporting source for the patient during their illness. A form support was to cheer up the patient to overcome the pain more adaptively. On the other hand, patients without partners are twice as likely to increase stressor sources [38].

Equally important is a full support from the family of breast cancer patients. Constant communication significantly increases their life quality. It is considered to have a direct effect on the patient's prosperity and emotional adjustments [39].

Complementary therapy such as the five-finger relaxation technique can be an alternative for pain management for breast cancer patients, not as a substitution for medical therapy (pharmacology). A benefit from this therapy is that it reduces the risk of side effects from analgesic use. This way, it will help diminish the patient's cost and raise their satisfaction on the healthcare service.

This research concludes that five-finger relaxation technique has a positive effect on the sleep quality, fatigue, and pain of breast cancer patients. This is indicated by post-test scores of the three symptoms, significantly lower than pre-test scores in control and intervention groups. This is supported by the improvement in intervention group significantly higher than the control group.

The result of this research is expected to be an analysis material for the nursing field regarding the choice of intervention to improve sleep quality and decrease fatigue and pain on breast cancer patients. In regard to the management, a good cooperation is required between nurses and other healthcare staff at Sekarwangi Hospital, Sukabumi District and R. Syamsudin, S.H. Hospital, Sukabumi, specifically when it comes to providing care for them. This research result may serve as foundation in developing the nursing intervention, as in choosing the better treatment for them.

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