

## ORIGINAL ARTICLE

# MUSKAR-T for Improving Mental Health and Cancer-related Symptoms in Women Diagnosed With Breast Cancer Undergoing Chemotherapy: A Queasy Experimental Design

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## ABSTRACT

**Introduction:** Women diagnosed with breast cancer experience severe psychological suffering, primarily stress and anxiety, as well as fatigue and sleep disruption. Purpose: The purpose of this study was to evaluate at how MUSKAR-T affected sleep quality and exhaustion with breast cancer patients undergoing chemotherapy. **Methods:** The study was queasy experimental with two group pre-post-test design. Patients in the intervention group were stimulated with muscular training. The Pittsburgh Sleep Quality Index (PSQI), the State Trait Anxiety Index (STAI), and the Cancer-related Fatigue Assessment (CFS) were applied. **Results:** This study had 100 participants, 50 in the intervention group and 50 in the control group. Anxiety, fatigue, and sleep quality scores in the intervention group dropped to 76.1112.42, 45.1214.76, and 4.363.30, respectively, the day before discharge from the hospital. **Conclusion:** The effect of combining culturally based music and muscle relaxation therapy on exhaustion, sleep quality breast cancer patients who have received unimproved chemotherapy.

**Keywords:** Fatigue, Sleep quality, Breast cancer

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## INTRODUCTION

Breast cancer is the second most frequent malignancy worldwide, over 1.67 million cases reported each year. (1). Breast cancer is the most prevalent cause of cancer death among women in developing countries (14.3 %) and the second most common cause of cancer death in developed countries (15.4 %) (2). Despite considerable advancements in cancer detection, diagnosis, and therapy, over one-third of women diagnosed with breast cancer have significant psychological distress, primarily depression and anxiety, while receiving breast cancer care (3), which can persist over the years following completion of treatment (3,4). Cancer-related fatigue (CRF) appears to be the most common and debilitating symptom of cancer patients. It is commonly used by breast cancer patients, with a range

of 27 percent to 96 percent, the type of drug administered, and the method of measurement (5). Sleep problems are very common in breast cancer patients before to surgery and during chemotherapy (6) and during antihormonal therapy (7). These conditions can exacerbate the severity of symptoms and have a significant influence on quality of life. (8).

Many interventions are carried out in this population to enhance fatigue, reduce anxiety, and improve sleep quality in women diagnosed with breast cancer, including music therapy (9), relaxation exercise (10,11), exercise (12), cognitive-behavioral intervention (13), and supportive intervention (14). The combination of music therapy and relaxation training, among the aforementioned modalities, has been shown to improve anxiety, exhaustion, and sleep quality through progressive muscle relaxation. (15) believes that relaxation therapy would be more effective if performed on two levels, namely the body and the mind. (16) suggests that progressive muscle relaxation alone, without further

therapies, is seen as energy- and calorie-consuming by certain individuals.

MUSKAR-T is a non-pharmacological treatment that blends culture-based music therapy with progressive muscle relaxation, both of which are methods of relaxation that connect the body and mind. Music may have a positive impact on humans' physiological, emotional, and spiritual dimensions (9). Music will cause changes in stress hormones in the patient as it is listened to and captured by sensory fibers and then transmitted to the cerebral cortex. There will be a decrease in frontal lobe activity that causes cortisol hormone secretion and a decrease in stress hormones that can increase comfort and cause a pleasant sensation as the music is listened to and captured by sensory fibers and then transmitted to the cerebral cortex (17). Sundanese gamelan is frequently played in Indonesia, particularly in West Java, and is presented instrumentally with a tempo of 60-100 beats per minute, has tone and rhythm components that can have a psychological and physiological influence on the body, and has tone and rhythm components that can have a psychological and physiological influence on the body (18). According to Herawan (2009), the musicality of gamelan is very delicate, therefore listening to it relaxes the mind. Progressive muscle relaxation (PMR) is a technique for increasing physical work capacity and reducing functional limits by tightening and relaxing specific muscle groups by triggering the sympathetic and parasympathetic nervous systems.(19) Progressive muscle relaxation is the least expensive approach to relax because it requires no inventiveness, has no negative effects, is simple to perform, and can make the body and mind feel quiet and relaxed. (20) A previous study<sup>13</sup> found that gradual muscular relaxation could improve sleep quality in hemodialysis patients. A systematic review was carried out to evaluate the efficacy of PMR in anxiety, sleep quality, and quality of life in other groups (20,21).

## MATERIALS AND METHODS

### Study design

The study was experimental in nature, with a two-group pre-post-test design. The study procedures were approved by the Institutional Review Board, and all subjects provided signed informed consent.

### Sample

Breast cancer patients were among those who took part in the trial. Based on the decrease in anxiety levels, 100 patients were recruited with 80% power, 5% statistical significance, a medium effect size, and a 10% drop out rate. Inclusion criteria were being between the ages of 25 and 65,

being female, having been diagnosed with breast cancer for at least 6 months, and undergoing chemotherapy.

### Intervention procedure

Relaxation therapy were administered to women in intervention group. MP3 players were used for music therapy (music listening). A music therapist taught the researchers in music collecting, volume management, time-based listening to music, and other music therapy-related issues. Sundanese gamelan is utilized and performed instrumentally at a tempo of 60-100 beats per minute, and it has tone and rhythm components that can have a psychological and physiological effect on the body. (18). Before hospital discharge, music was played twice a day, once in the early morning (6:00 a.m.-8:00 a.m.) and once in the evening (9:00 a.m.-11:00 p.m.), for 30 minutes each time. Music therapy was conducted and completed by all intervention group subjects as necessary.

Relaxation therapy is an approach entails persistent and complete body strengthening and relaxation until the entire body is at ease (22). Patients in this study were instructed to tense and release muscles. A gradual muscular stimulation training, similar to music therapy, lasted twice a day for 30 minutes every session before being discharged from the hospital, once in the mornings and once in the evenings. As a result, patients were recommended to perform muscular stimulation while listening to music. The researchers performed muscle progressive muscle relaxation in an orderly and stage process based on the patients' status before the patients could exercise happily and easily without unpleasant symptoms. The lesson was attended and finished by both patients in the intervention group.

### Instrument

Age, age at diagnosis, marital status, stage of disease, menopausal status, clinicopathological data collected.

The Pittsburgh Sleep Quality Index (PSQI) was used to assess sleep quality. It consists of seven components that measure sleep latency, subjective sleep quality, sleep length, normal sleep effectiveness, sleep disruption, sleeping medication use, and daytime dysfunction (23). A total score of 7 components determines the overall score. Each section is worth 0–3 points, for a total score of 0–21. A lower overall score indicates poor sleep quality. The starting point is a score of 5 points. A score of five or above indicates a sleeping disorder (23). In the current investigation, the cronbach's alpha was 0.82. (good).

Through self-report, the State Trait Anxiety Index

(STAI) has been used to assess the existence, intensity, and prevalence of anxiety symptoms. The STAI contains 40 items, 20 of which are assigned to each of the Anxiety status and trait subscales. Each subtest has a score range of 20–80, with higher scores indicating greater anxiety. With 1-104 day intervals, the initial development test-retest reliability coefficient ranged from 0.31 to 0.86 (20). In the current investigation, the cronbach's alpha was 0.78. (good).

Fatigue of the subjects has been measured by a short self-rated scale for cancer-related fatigue assessment (CFS). The scale has 15 aspects and three subscales: physical, emotional, and cognitive. Every item is rated on a scale of one (not at all) to five (very much). For each subscale, the best values range from 0 to 28 (physical), 0 to 16 (affective), and 0 to 16 (cognitive). The maximum possible score is 60. Higher scores indicate more weariness. (24). The cronbach's alpha in the current study was 0.83 (good).

#### Data analysis

For categorical data, Prevalence and percentage collected. To discover differences in baseline data between groups, independent samples of t-test and chi-square tests were utilized. The related alterations

in outcomes between posttest and pretest were found to be changes in anxiety, exhaustion, and sleep quality. A p-value of less than 0.05 is considered statistically significant (two-sided). All statistical analyses used SPSS 20.0.

#### Ethical Clearance

This study was approved by Research Ethics Committee, Departement of Nursing, Sekolah Tinggi Ilmu Keperawatan Jawa Barat No. 0119/KEPK/STIKEP/PPNI/JABAR/VIII/2020.

#### RESULTS

This study had 100 participants, 50 in the intervention group and 50 in the control group. The majority of respondents were married, unemployed, had completed at least middle school, were not menopausal, and were in stage III of the condition. The intervention group's average age is 46.71 years, with a standard deviation of 5.41. The control group's average age was 46.53 years, with a standard deviation of 6.09. The mean age at diagnosis in the intervention group was 42.59 (SD=6.72) and 43.02 (SD=5.14) in the control group. At baseline, the demographic features of the two groups of patients were similar ( $P > 0.05$ ). (Table I).

**Table I : Demographic characteristics of breast cancer women by group (n=100) (n, %)**

Characteristics	Intervention Group	Control group	p-value
	n=50, (%)	n=50, (%)	
Age in year (Mean $\pm$ SD)	46.71 $\pm$ 5.41	46.53 $\pm$ 6.09	0.477
Age at diagnosed (Mean $\pm$ SD)	42.59 $\pm$ 6.72	43.02 $\pm$ 5.14	0.246
Education level			
Middle school and below	34 (68)	30 (60)	0.077
Middle school and below	16 (32)	20 (40)	
Marital status			
Married	30 (60)	35 (70)	0.089
Single	20 (40)	15 (30)	
Working status			
Empolyed	38 (76)	40 (80)	0.674
Unemployed	12 (24)	10 (20)	
Monthly income in USD (Mean $\pm$ SD)	100.95 $\pm$ 17.37	105.26 $\pm$ 13.04	0.372
Meanopasusal status			
Yes	12 (24)	14 (28)	0.456
No	38 (76)	36 (72)	
Stage of disease			
II	15 (30)	12 (24)	0.056
III	23 (46)	19 (38)	
IV	12 (24)	19 (38)	

**Table II : Between-group comparison of anxiety scores, fatigue, and sleep quality (mean  $\pm$  SD): a general liner model with univariate analysis<sup>a</sup>**

	Anxiety		Fatigue		Sleep quality	
	Pre-test	Post-test	Pre-test	Post-test	Pre-test	Post-test
Total (N=100)	83.72 $\pm$ 13.52	76.11 $\pm$ 12.42	53.04 $\pm$ 11.12	45.12 $\pm$ 14.76	6.89 $\pm$ 4.41	4.36 $\pm$ 3.30
Intervention group	81.34 $\pm$ 11.80	72.56 $\pm$ 12.01	51.43 $\pm$ 10.43	45.04 $\pm$ 13.01	6.32 $\pm$ 3.75	4.04 $\pm$ 3.42
Control group	83.01 $\pm$ 13.65	80.17 $\pm$ 12.30	54.66 $\pm$ 11.76	49.93 $\pm$ 14.25	6.45 $\pm$ 4.58	5.97 $\pm$ 4.65
Group	F=10.34 p<0.001		F=9.38 p<0.001		F=7.51 p<0.001	
Time	F=43.75 p<0.001		F=33.75 p<0.001		F=56.23 p<0.001	
Group*time	F=4.56 p<0.001		F=3.72 p<0.001		F=4.35 p<0.001	

The pre-test anxiety, exhaustion, and sleep quality scores did not differ significantly. Anxiety, fatigue, and sleep quality scores in the intervention group dropped to 76.11 $\pm$ 12.42, 45.12 $\pm$ 14.76, and 4.36 $\pm$ 3.30, respectively, the day before discharge.

Anxiety, fatigue, and sleep quality were the independent variables in the general liner model.

## DISCUSSION

Through a cross-group comparison, the study found that Anxiety and fatigue was reduced by using combination of culturally based music therapy and progressive muscle relaxation in breast cancer women who were receiving undegraded chemotherapy (both group and time effect). In this study, the intervention-time interaction effects were primarily found. First, both groups of patients exhibited anxiety, exhaustion, and poor sleep quality, showing anxiety, fatigue, poor sleep quality improved with time, implying that time was the most important element in improving anxiety, fatigue, and sleep quality.

According to the findings of this study, fatigue scores for women fell below the clinically significant exhaustion cut-off. Despite significant fatigue levels during the trial, compliance to the method was excellent, with more than 80% of individuals completing the assigned job. This is significant since

fatigue is typically a major barrier to participation in activity therapies in cancer patients, including progressive muscle relaxation, which is not specifically designed to alleviate fatigue. We feel that the unique combination of gradual muscle relaxation plays an important part in assuring trial compliance for weary individuals, as well as using suggestions and ideas that allow these poses to be performed simply or stress-free.

The study had certain drawbacks. Second, there was a scarcity of physiological data on anxiety, exhaustion, and sleep quality. Second, because the study was conducted in West Java, the findings could not be generalized to all female breast cancer patients taking chemotherapy in Indonesia.

## CONCLUSION

Women undergoing treatment for breast cancer can benefit from music therapy and progressive muscle relaxation exercise. More study using more robust methodology and larger sample sizes is required to confirm these findings.

## ACKNOWLEDGEMENT

This study is supported by Ministry of Research and Technology/National Research and Innovation Agency (Indonesia).

## REFERENCES

1. DeSantis C, Siegel R, Jemal A. Breast cancer facts & figures 2015–2016. *Am cancer soc.* 2015;44.
2. DeSantis CE, Bray F, Ferlay J, Lortet-Tieulent J, Anderson BO, Jemal A. International variation in female breast cancer incidence and mortality rates. *Cancer Epidemiol Prev Biomarkers.* 2015;24(10):1495–506.
3. Rottmann N, Hansen DG, Hagedoorn M, Larsen PV, Nicolaisen A, Bidstrup PE, et al. Depressive symptom trajectories in women affected by breast cancer and their male partners: a nationwide prospective cohort study. *J Cancer Surviv.* 2016;10(5):915–26.
4. Hopwood P, Haviland JS, Sumo G, Mills J, Bliss JM, Yarnold JR. Comparison of patient-reported breast, arm, and shoulder symptoms and body image after radiotherapy for early breast cancer: 5-year follow-up in the randomised Standardisation of Breast Radiotherapy (START) trials. *Lancet Oncol.* 2010;11(3):231–40.
5. Goedendorp MM, Jacobsen PB, Andrykowski MA. Fatigue screening in breast cancer patients: identifying likely cases of cancer-related fatigue. *Psycho-Oncology.* 2016;25(3):275–81.
6. Van Onselen C, Cooper BA, Lee K, Dunn L, Aouizerat BE, West C, et al. Identification of distinct subgroups of breast cancer patients based on self-reported changes in sleep disturbance. *Support Care Cancer.* 2012;20(10):2611–9.
7. Desai K, Mao JJ, Su I, DeMichele A, Li Q, Xie SX, et al. Prevalence and risk factors for insomnia among breast cancer patients on aromatase inhibitors. *Support Care Cancer.* 2013;21(1):43–51.
8. Gwede CK, Small BJ, Munster PN, Andrykowski MA, Jacobsen PB. Exploring the differential experience of breast cancer treatment-related symptoms: a cluster analytic approach. *Support Care Cancer.* 2008;16(8):925–33.
9. Li X, Zhou K, Yan H, Wang D, Zhang Y. Effects of music therapy on anxiety of patients with breast cancer after radical mastectomy: a randomized clinical trial. *J Adv Nurs.* 2012;68(5):1145–55.
10. Kovačič T, Zagoričnik M, Kovačič M. Impact of relaxation training according to the Yoga In Daily Life® system on anxiety after breast cancer surgery. *J Complement Integr Med.* 2013;10(1):153–64.
11. Kashani F, Babaee S, Bahrami M, Valiani M. The effects of relaxation on reducing depression, anxiety and stress in women who underwent mastectomy for breast cancer. *Iran J Nurs Midwifery Res.* 2012;17(1):30.
12. Ergun M, Eyigor S, Karaca B, Kisim A, Uslu R. Effects of exercise on angiogenesis and apoptosis-related molecules, quality of life, fatigue and depression in breast cancer patients. *Eur J Cancer Care (Engl).* 2013;22(5):626–37.
13. Yoo M-S, Lee H, Yoon J-A. Effects of a cognitive-behavioral nursing intervention on anxiety and depression in women with breast cancer undergoing radiotherapy. *J Korean Acad Nurs.* 2009;39(2):157–65.
14. Bjurneklett HG, Lindemalm C, Rosenblad A, Ojutkangas M-L, Letocha H, Strang P, et al. A randomised controlled trial of support group intervention after breast cancer treatment: results on anxiety and depression. *Acta Oncol.* 2012 Feb;51(2):198–207.
15. Pieszak S. Evidence-based interventions for chemotherapy-induced nausea and vomiting. *Am Nurse Today.* 2011;6(10):4.
16. Choi YK. The effect of music and progressive muscle relaxation on anxiety, fatigue, and quality of life in family caregivers of hospice patients. *J Music Ther.* 2010;47(1):53–69.
17. Snyder M, Lindquist R. An overview of complementary/alternative therapies. *Complement Ther Nursing 4th ed* New York, NY Springer Publ Co. 2002;3–15.
18. Astuti D. *Lagu Dan Alat Musik Tradisional Provinsi Jawa Barat.* Bandung: Sarana Pancakarya Nusa; 2009.
19. Ramdhani N, Putra AA. Pengembangan multimedia relaksasi. Yogyakarta bagian psikologis Klin Fak Psikol UGM. 2008;
20. Melo-Dias C, Lopes RC, Cardoso DFB, Bobrowicz-Campos E, Apystolo JLA. Schizophrenia and Progressive Muscle Relaxation—A systematic review of effectiveness. *Heliyon.* 2019;5(4):e01484.
21. Manzoni GM, Pagnini F, Castelnuovo G, Molinari E. Relaxation training for anxiety: a ten-years systematic review with meta-analysis. *BMC Psychiatry.* 2008;8(1):41.
22. Lee J, Dibble SL, Pickett M, Luce J. Chemotherapy-induced nausea/vomiting and functional status in women treated for breast cancer. *Cancer Nurs.* 2005;28(4):249–55.
23. Hasina SN, Sukartini T, Setiyowati E. Effect Of Sleep Hygiene And Deep Breathing Exercise With Spiritual Care On Sleep Quality And Quality Of Life Of Hemodialysis Patient In Ahmad Yani Islamic Hospital Surabaya. *J Ners dan Kebidanan Indones.* 2018;6(2):140–51.
24. Okuyama T, Akechi T, Kugaya A, Okamura H, Shima Y, Maruguchi M, et al. Development and validation of the cancer fatigue scale: a brief, three-dimensional, self-rating scale for assessment of fatigue in cancer patients. *J Pain Symptom Manage.* 2000 Jan;19(1):5–14.