

Progressive Muscle Relaxation and Symptoms of Women with Breast Cancer Undergoing Adjuvan Chemotherapy

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Progressive Muscle Relaxation and Symptoms of Women with Breast Cancer Undergoing Adjuvan Chemotherapy

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Abstract

This study was performed to examine effect of PMR on health related quality of life domains in breast cancer women received adjuvan chemotherapy, with one group pre-test post-test design. It was conducted among 15 breast cancer women received adjuvan chemotherapy who met the criteria for inclusion in the study with consecutive sampling in surgical outpatient of Wahidin Sudiro Husodo Hospital. The participants were instructed practice PMR for 12 days twice a day. First day and thirteenth day EORTC QLQ-30 version 3.0 questionnaires used to collected data. Average range of all obtained EORTC QLQ-30 symptom scales improved significantly: fatigue, nausea-vomiting, pain, insomnia, lack of appetite; except for dyspnea. Dyspnea are initially mild to no complaints at all, whereas cognitive function requires a longer period to be optimal return. PMR improved domains of health related quality of life among breast cancer women received adjuvan chemotherapy.

Keywords: breast cancer, adjuvan chemotherapy, progressive muscle relaxation, symptom

Introduction

The main risk factor for breast cancer is being a woman and the existence of an aging process, these two things are unavoidable conditions.⁽¹⁾ Adjuvant chemotherapy is an important modality for handling breast cancer. This therapy reduces the risk of death and recurrence of breast cancer, but often results in a decrease in health-related quality of life (HRQoL) because it causes a variety of physical disorders and a negative impact on the psychological client.^{(2),(3)} Most of the women with breast cancer who went to Wahidin Sudiro Husodo Hospital, shared their complaints about the adjuvant chemotherapy. Physical disorders they often complain of include nausea and vomiting, decreased appetite, fatigue, insomnia, and pain. Various physical disorders that these natural clients cause anxiety. These physical and psychological disorders often result in disruptive client socialization and daily activities.

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Progressive muscle relaxation is one of the independent nursing interventions that can be used to alleviate physical and psychological disorders due to adjuvant chemotherapy.^{(4),(5)} Reduced physical and psychological disorders due to chemotherapy will improve various domains in health-related quality of life.⁽⁶⁾

Global breast cancer is the most common cancer in women and the leading cause of death due to cancer.^{(7),(8)} Breast cancer incidence has increased in almost all regions of Indonesia including in East Java. Since 2009, breast cancer has been ranked first in both outpatient and inpatient units in hospitals throughout East Java.⁽⁹⁾ Based on medical record of Wahidin Sudiro Husodo Hospital, the number of women with breast cancer who checked into Surgery Polyclinic in 2011 were 136 women, in 2012 were 220 women, in 2013 from January-May were 93 women and $\pm 60\%$ of the client underwent a mastectomy followed by administration of adjuvant chemotherapy.

Today health-related quality of life is an important issue both during the diagnosis process, the period of treatment and recovery of women with breast cancer.

^{(10),(11),(12),(13)} and an important end-point in various clinical studies on cancer.^{(3),(14)} Information about quality of life related to health will improve client care because it has several benefits, namely as a prognostic indicator, explaining and knowing the side effects of adjuvant therapy, facilitating and assisting the decision making process, providing a more efficient treatment and care strategy, predicting morbidity and mortality strong, and provide information for policy setting and resource allocation. Domains on quality of life related to health are global health status/quality of life, functional status (physical function, role function, cognitive function, social function), several symptoms (fatigue, nausea, vomiting, pain, insomnia, shortness of breath, decreased appetite) and financial circumstances are an important indicator of how well an individual can function since the diagnosis process, treatment period and after treatment.⁽¹⁵⁾ These domains will experience changes due to adjuvant chemotherapy.^{(10),(16)} Improvements to quality of life related to health must be carried out because it is expected to have a positive impact on both individual, family and health clients nationally.⁽¹⁵⁾

Based on the Nursing Intervention Classification (NIC), progressive muscle relaxation is one of the nursing interventions that is used to improve physical comfort.⁽¹⁷⁾ This exercise aims to induce a sense of relaxation so that the physical and psychological disorders caused by adjuvant chemotherapy are reduced, to achieve this goal the client must strain and relax some muscle groups and focus on the difference between tension and relaxation of the muscle.⁽⁵⁾ Relaxation induced by progressive muscle relaxation decreases the work of the sympathetic nervous system resulting in a decrease in blood pressure, pulse and muscle tone, as well as changes in neuroendocrine function thereby reducing body oxygen consumption, metabolic rate, respiratory rate and muscle tension.⁽¹⁸⁾ Progressive muscle relaxation improves sleep disturbances and pain in individuals with cancer.⁽¹⁹⁾ Progressive muscle relaxation is one of the non-pharmacological interventions to reduce shortness of breath in cancer patients through a mechanism for reducing anxiety. Systematic review with a meta-analysis states that relaxation exercises consistently and significantly reduce anxiety. Psychosocial interventions, one of which is progressive muscle relaxation both independently and in combination, effectively improves the quality of life, especially in the emotional function

domain of cancer patients.^{(20),(21)} The behavioral therapy is one of relaxation, effectively controlling nausea and vomiting in patients receiving chemotherapy, reducing pain and anxiety and distress in cancer patients during invasive procedures.⁽²²⁾

This study aims to determine differences in symptoms of women with breast cancer undergoing adjuvant chemotherapy before and after carrying out progressive muscle relaxation.

Method

This study used one-group pretest-posttest design. The population were all women with breast cancer who received adjuvant chemotherapy, who checked into the Surgical Polyclinic, Wahidin Sudiro Husodo Hospital, Mojokerto-Indonesia from January to February 2014. Samples were breast cancer women who had inclusion criteria aged 30-60 years, post-mastectomy, had received at least 1 session of adjuvant chemotherapy, cooperated and could communicate in Indonesian well, could read and write, was willing to participate in signing an informed concentration and stage 4 breast cancer exclusion criteria, there were other serious illnesses such as diabetes mellitus and/or hypertension, there was a history or is experiencing a mental disorder and neurological disorders, experiencing visual and hearing impairment, musculoskeletal disorders. The sample size was 15, selected by consecutive sampling. Respondents were asked to do progressive muscle relaxation for 12 days (5 days with assistance and 7 days independently). On the first day before carrying out progressive muscle relaxation and the 13th day data collection was carried out using the EORTC QLQ-30 questionnaire. Data were analyzed by paired-sample-t-test and Wilcoxon-Sign-Rank-Test.

Findings and Discussion

Table 1. Description of Vital Signs of Breast Cancer Clients Undergoing Adjuvant Chemotherapy Before and After Progressive Muscle Relaxation

Vital Sign	Mean±SD Before PMR	Mean±SD After PMR	p-value
Pulse	81.53±1.27	78.89±1.26	0.00
Systole	113.6±1.72	109.83±1.53	0.00
Diastole	79.53±0.96	76.85±0.98	0.00
Respiratory-Rate	17.17±0.31	15.14±0.25	0.00

Table 2. Mean Differences of Symptoms of Breast Cancer Clients Undergoing Adjuvant Chemotherapy Before and After Progressive Muscle Relaxation

Variabel	Mean±Standard Deviation Before PMR	Mean±Standard Deviation After PMR	p-value
Fatigue	69.73±22.84	30.80 ±11.90	0.001
Nausea-vomiting	46.80 ±21.20	12.33 ±11.71	0.001
Pain	39.93±17.76	14.47 ±13.79	0.001
Dyspnoea	4.40±11.61	0.00 ±0.00	0.157
Insomnia	55.60±27.38	26.60 ±25.90	0.002
Appetite loss	75.73±19.74	35.47 ±23.60	0.001

In the EORTC QLQ-30 questionnaire a high score on signs and symptoms represents a high level of symptomatology/problem, if the score decreases it means that the problem has decreased or improved.⁽²³⁾

In this study aggressive muscle relaxation significantly reduced fatigue in breast cancer respondents undergoing chemotherapy. Fatigue due to chemotherapy can appear suddenly and not disappear with rest. Adjuvant chemotherapy contributes to causing and increasing fatigue through its side effects including anemia, lack of nutritional intake due to nausea, vomiting, pain, emotional distress, sleep disturbances. These conditions will lead to increased energy use so that respondents feel excessive fatigue.^{(6),(24),(25)} This situation if not immediately addressed can cause a decrease in the quality of life related to the health of the respondent. Progressive muscle relaxation is an independent nursing intervention that can be used to alleviate various causes of fatigue due to chemotherapy effects of pain, nausea, vomiting, anxiety or general distress. Progressive muscle relaxation significantly reduces fatigue and improves sleep quality in Turkish women who have breast cancer and receive adjuvant chemotherapy. The mechanism of progressive muscle relaxation in reducing fatigue is by inducing a relaxed feeling so as to reduce the arosal sympathetic nerves that fall on a decrease in muscle spasm as a result of decreased pain, if the muscle spasm in the digestive tract decreases then CTZ will be stimulated so that nausea and vomiting decreases, anxiety is resolved. Feelings of relaxation and reduced symptoms will increase energy storage so fatigue can be prevented or overcome. Vomiting or vomiting is the removal of gastric contents by force through the

mouth or nose. Afferent input in the emetic center is from the Chemoreceptor trigger zone (CTZ) located in the postrema area in the cortex and the CTZ is sensitive to the chemical stimulus of the cerebrospinal fluid and blood. This mechanism is the basis for the occurrence of nausea and vomiting in cancer respondents who received adjuvant chemotherapy.⁽²⁶⁾ Nausea and vomiting that occurred in the respondents in this study was an anisctorial type, namely nausea and vomiting reported by patients before chemotherapy and delayed, namely nausea and vomiting 24 hours to 5 days after administration of chemotherapy. The use of progressive muscle relaxation to treat nausea and vomiting in respondents who received chemotherapy showed significant results.⁽²⁷⁾ Progressive muscle relaxation reduces nausea and vomiting through a mechanism of distraction and decreases CTZ sensitivity to vomiting.⁽²⁸⁾ When carrying out a progressive muscle relaxation exercise the respondent will concentrate on training and focus on distinguishing tense and relaxed feelings so that his attention to the side effects of chemotherapy, especially nausea and vomiting, will be distracted. At the time of nausea and vomiting, sympathetic arosal such as blood pressure, pulse, muscle spasm in the digestive tract will increase, with relaxation the general distress will decrease so that the sensitivity of the vomiting receptor in CTZ also decreases. Nausea and vomiting due to adjuvant chemotherapy side effects will interfere with other determinants of health-related quality of life. This exercise can be given before, during and after a procedure or achieved so as to prevent the occurrence of acute, anticipatory and delayed nausea and vomiting, this procedure can be taught before, during and after chemotherapy.⁽²⁹⁾

Cancer itself and treatment with chemotherapy can cause pain. Pain results in helplessness, inability, despair to social isolation so that it has a negative impact on daily activities and the socialization of respondents.⁽³⁰⁾ Progressive muscle relaxation is a relaxation technique that significantly improves sleep and sleep disorders in patients with cancer. The mechanism of progressive muscle relaxation decreases norepinephrine because it reduces proprioceptive impulses to the hypothalamus so that sympathetic arousal decreases. Reduced release of norepinephrine will reduce muscle spasm which results in a decrease in pain perception. In this study some respondents used analgesic pharmacological therapy to reduce the pain they experienced. This needs to be considered as a confounding factor in the study.⁽¹⁹⁾

Sleep disturbances or insomnia are abnormalities for starting and maintaining sleep that occur repeatedly. Sleep disturbances can also be caused by psychological and environmental factors.⁽²⁵⁾ Various physical symptoms: pain, nausea, vomiting, shortness of breath and psychic: anxiety until depression that accompanies chemotherapy results in insomnia. The literature review by the American Academy of Sleep Medicine (1999) states that progressive muscle relaxation is one of the three non-pharmacological therapies used for the treatment of chronic insomnia and Barrows & Jacobs (2002) states progressive muscle relaxation is effective for insomnia and headaches⁽¹⁸⁾. Progressive muscle relaxation improves sleep quality. Relaxation can improve sleep quality because it induces a relaxed feeling that causes physical and psychological symptoms due to decreased chemotherapy.⁽²⁶⁾

Chemotherapy causes digestive tract disorders because most chemotherapy drugs react to cells that have rapid growth, the manifestation of side effects associated with somatic cells of the body that normally have fast cleavage abilities, one of which is the digestive tract. Nausea vomiting is the most complained symptom due to chemotherapy.⁽⁴⁾ Progressive muscle relaxation significantly reduces both nausea and vomiting symptoms through distraction and decreases the sensitivity of CTZ.^{(27),(28)} so that indirectly if this symptom decreases the appetite of the respondent will return. In this study some respondents used antiemetic pharmacological therapy to reduce the nausea and vomiting they experienced. This needs to be considered as a confounding factor in the study.

In the study the decrease in mean shortness of breath before and after progressive muscle relaxation was not significant, this is probably due to the shortness of breath score before relaxation (pre-test) was already low or even zero meaning that most respondents did not experience shortness. Some chemotherapy agents directly cause damage to the lungs, one of the manifestations is tightness. Adjuvant chemotherapy drugs for breast cancer most often cause fatigue, indigestion and spinal cord suppression.⁽²⁵⁾

Based on the frequency distribution table between demographic data (age, status, occupation and income) with the average of each symptom, the data is almost entirely the average symptom score has decreased after progressive muscle relaxation and a small portion of the mean score remains. Based on the stage of cancer and the chemo cycle, the majority of respondents have decreased symptom scores and a small percentage remain. Various cancer-related symptoms and treatments are influenced by various factors. Various symptoms in cancer respondents, besides being influenced by demographic factors (age, income and marital status), are also influenced by psychosocial factors (anxiety, individual coping, self-efficacy, and social support), biological factors (anemia, changes in immunity and neuroendocrine function).⁽⁶⁾ A small percentage of the average symptom score did not decrease probably due to other factors influencing this situation, such as individual coping, self-efficacy, social support and anemia, where this condition has not been seen in this study.

Conclusion

Conclusions from this study were differences in symptoms of women with breast cancer undergoing adjuvant chemotherapy before and after carrying out progressive muscle relaxation.

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Conflict of Interest- No

Ethical Clearance- Yes

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