



THE EFFECT OF WALKING EXERCISE PROGRAM FOR REDUCING FATIGUE IN CANCER PATIENTS UNDERGOING MEDICAL TREATMENT

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ABSTRACT

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Cancer is one of the most serious problems in the world and Indonesia because the number of sufferers continues to increase. The most common symptom felt by cancer patients undergoing treatment is fatigue. Fatigue management consists of pharmacological and non-pharmacological. Physical activity, such as walking exercise programs, is a therapeutic option for reducing cancer-related fatigue (CRF). This study aimed to determine the effect of applying a walking exercise program on the level of fatigue in cancer patients undergoing treatment. This study used a time series method without a control group design. The respondents were 13, and the criteria were cancer patients undergoing treatment. The instrument uses the Brief Fatigue Scale- Indonesian version. The implementation of the Walking Exercise Program (WEP) in the first week of the patient's fatigue score was 39.77; the results of the second-week application score was 20.31, and the application given in the third week dropped to 14.46. The results of the Greenhouse-Geisser test have a significance value of $0.03 < 0.05$, then H_0 is rejected, and H_a is accepted. Applying the Walking Exercise Program (WEP) reduces fatigue in cancer patients undergoing treatment.

Keywords:

Cancer, Fatigue, Physical, Symptom control, Walking exercise

BACKGROUND

The increasing prevalence of cancer patients worldwide and in Indonesia, as well as the disease's wide-ranging effects on patients' lives, cancer is a severe problem (Grimsbo, Ruland & Finset, 2012). According to data from the North American Association of Central Cancer Registries (NAACCR), there will be an expected 1,918,030 new cancer cases in the United States in 2022, or 5,250 new cases each day. This figure is broken down by gender and kind of cancer. In addition, 609,360 cancer-related deaths are anticipated in the US in 2022, which works out to almost 1,700 fatalities daily (Siegel et al., 2022).

The prevalence of cancer in Indonesia in 2018 was 1.8%, or 1,017,290 people, according to data from Riskesdas. In Indonesia, 4.62% of cancer patients are between the ages of 55 and 64. In addition, women experience cancer at a higher rate than males do-2.85% for women against 0.74% for men. Yogyakarta has the highest cancer rate in Indonesia, at 4.86%. West Sumatra is in second place with a prevalence of 2.47%, while Gorontalo is in third place with a prevalence of 2.44% (Kemenkes RI, 2018).

Patients diagnosed with cancer will experience various impacts from all aspects, including physical, psychological, social and spiritual, as a consequence of the long process of treatment and care (Effendy et al., 2014; Ferrell & Paice, 2010; Vallurupalli et al., 2012). Surgery, chemotherapy, immunotherapy, targeted therapy, hormone therapy or endocrine therapy, radiotherapy, and cell transplantation are among the treatments that can be utilized for cancer therapy. The physical side effects of this cancer treatment include exhaustion, discomfort, hair loss, nausea, vomiting, and weariness (Zakiyyah et al., 2017).

Fatigue is a state of physical, mental, and emotional tiredness brought on by illness or cancer therapy and excessive fatigue from the activities undertaken. The consequences can cause problems before, during, or after treatment (Gheyasi et al., 2019; Rufaida et al., 2020a). According to (Jurwita et al., 2021), 88% of cancer patients complain of fatigue, which is frequently disregarded and neglected because it is not regarded as a life-threatening condition.

Physical exercise, such as a walking exercise program, is one of the therapy choices to lessen the severity of Cancer-Related Fatigue (CRF) (Herranz-Gómez et al., 2023). The effect of exercise on fatigue in cancer patients undergoing treatment has been well-referenced from previous meta-

analysis studies (Juvet et al., 2017; Meneses-Echávez et al., 2015). The other study also found a positive impact of a home-based brisk walking program on decreasing fatigue during chemotherapy, even with low exercise, and it is possible to initiate early to establish long-term healthy behaviors (Huang et al., 2019; May et al., 2018). The Walking Exercise Program is an exercise option because it can increase body strength and endurance and reduce emotional stress and anxiety that are often experienced by cancer patients (Darma et al., 2020; Hayuningrum et al., 2022). This is consistent with study results published in 2020, which show that walking exercise can help lessen cancer-related fatigue (CRF). This is because walking can alter the respondents' level of weariness by increasing the oxygen cascade (oxygen flow) and metabolism. In addition, walking exercises done three to four times a week positively impacted tiredness complaints for breast cancer patients receiving therapy (Rufaida et al., 2020a).

Based on previous studies, the current study aimed to determine the effect of the application of a walking exercise program on the level of fatigue in cancer patients undergoing treatment. To improve the quality of the services provided by health professionals, particularly when it comes to offering interventions to control fatigue symptoms, this research must be undertaken.

METHODS

This study used a quantitative, quasi-experimental methodology using a time series design to examine how a walking exercise program affects fatigue levels in cancer patients receiving active therapy. The research was conducted offline in 2 places in Samarinda by prioritizing health protocols. In this study, the intervention was given to the intervention group through mentoring and education about the walking exercise program, which was carried out once a week for 3 weeks for 30 minutes. The eligibility criteria were set for recruiting patients: being diagnosed with cancer, being able to communicate in Indonesian and complete the questionnaire and being older than 18 years old. Patients with psychiatric and cognitive disorders which affect their cognitive ability were excluded. A patient who suffered during collecting data was allowed to stop and excluded. In addition, patients who followed the study protocol after completion were excluded. The sample in this study consisted of 13 participants with 90% power, a 1-sided alpha level of 0.01, and a 10-50% anticipated drop-out rate. The sampling technique uses the con-

secutive sampling technique.

The questionnaire used to assess the level of fatigue in cancer patients was Brief Fatigue Inventory (BFI). BFI consists of 4 questions that measure the severity of fatigue and 6 questions to determine the effect of fatigue on patients' daily activities. Selection of a numerical scale for each item of 0-10 to describe the level of fatigue. The Indonesian version's Cronbach alpha is 0.95 (Paramita et al., 2016). The intervention was a walking exercise program that was done for three weeks once a week for 30 minutes. Considering the patients' condition, we separated 30 minutes into 2 parts. In order to describe the fatigue condition in cancer patients undergoing active therapy and other clinical situations, univariate analysis was analyzed in this study's data analysis and moreover, a continued bivariate analysis was performed using Repeated Anova and post hoc analysis.

RESULTS

According to Table I, which lists the characteristics of the respondents, there were a total of 10 respondents (76% of whom were female), 6 respondents (46.2% of whom were in the 46-55 age range), 4 respondents (30.8%) with an average diagnosis of breast cancer, followed by cervical cancer and bone metastatic breast cancer, and 9 respondents (69%) with an average disease stage of 3.

According to the above table, the average fatigue score for cancer patients receiving Walking Exercise therapy in weeks one and two was 39.77, 20.31, and 14.46, respectively.

Who is disregarded, and H_a is accepted based on Table 3's Greenhouse-Geiser value, which has a significance value of 0.03 0.05. Therefore, it may be inferred that the Walking Exercise Program (WEP) can be used to help cancer patients feel less worn out.

A significant value ($p < 0.05$) was achieved using Table 4 and the post hoc paired-wise comparison test. Thus, it can be said that using walking exercises to treat cancer patients can lessen their level of fatigue.

DISCUSSION

The findings indicated that 13 out of the total respondents felt fatigued. Cancer-Related Fatigue (CRF) is a commonly reported feeling of tiredness associated with cancer and cancer treatment that cannot be relieved by rest or sleep (Cheng et al., 2022; Twomey et al., 2018). The pathophysiology of CRF

needs to be better understood. It is believed that cytokine dysregulation has an important role in the occurrence of CRF. The production of cytokines by the body is believed to be the cause of fatigue complaints. Cytokines are proteins that act as connectors between cells, and cytokine production in cancer patients is higher than in healthy individuals because of its function, which is related to immunity (Amelia et al., 2020). Epidermal growth factor receptor (EGFR) ligands such as transforming growth factor- α (TGF- α) inhibit hypothalamic rhythmic behavior signals, which result in fatigue, disruption of the circadian cycle and loss of appetite (Hayuningrum et al., 2022).

The reasons for cancer-related fatigue are multi-factorial and may include elements including tumor-related variables, comorbid illnesses, psychosocial disorders, and adverse effects of cancer therapy adverse effects (Huang et al., 2019). A similar viewpoint was also articulated by (Sulistini, 2020), who defined exhaustion as an unpleasant emotion connected to a specific sensation of fatigue and physical and mental capacity that cannot be diminished by rest.

According to previous research, internal and external variables can both contribute to cancer-related fatigue. Psychological distress, such as anxiety and depression, which is an internal factor that aggravates fatigue complaints, and sociodemographic conditions, such as age, mental status, work history, economic status, patterns of social support, and culture, which an external factor, all contribute to fatigue complaints (Rosliana Dewi, 2021). Cancer patients who receive therapy feel worn out once their course of treatment is over. Therefore, some patients may feel the desire to stop receiving therapy altogether, which should not be disregarded as it may have a detrimental effect on the progression of the illness (Menga et al., 2021).

Cancer patients might receive both pharmaceutical and non-pharmacological treatments for fatigue. One of the most effective non-pharmacological therapies for decreasing weariness is physical activity. Many physical activities, however, necessitate consistent, qualified professional coaching or supervision by researchers or nursing professionals. Complex exercises that can have a detrimental impact on compliance and adaptation must be taught to patients. It is said that nurses spend much time doing this. Its shortcomings prevent it from having a long-lasting favorable impact on patients (Wang et al., 2020).

As a result, modest forms of exercise have a long-term beneficial impact on raising the quality of

Table 1. Patient Characteristics

| Gender: | Frequency (f) | Percentage (%) |
|-------------------------------|----------------------|-----------------------|
| Man | 3 | 23.1 |
| Woman | 10 | 76.9 |
| Age: | | |
| 17-25 | 1 | 7.7 |
| 36-45 | 3 | 23.1 |
| 46-55 | 6 | 46.2 |
| 56-65 | 3 | 23.1 |
| Diagnosis: | | |
| Cervical cancer | 3 | 23.1 |
| Bone metastatic breast cancer | 3 | 23.1 |
| Lung tumor | 1 | 7.7 |
| Parotid swelling | 1 | 7.7 |
| Breast cancer | 4 | 30.8 |
| Prostate cancer | 1 | 7.7 |
| Stadium: | | |
| Stage 2 | 3 | 23.1 |
| Stage 3 | 9 | 69.2 |
| Stage 4 | 1 | 7.7 |
| Time span: | | |
| < 6 months | 3 | 23.1 |
| >2 years | 10 | 76.9 |
| Treatment: | | |
| Radiotherapy | 5 | 38.5 |
| Surgery & chemotherapy | 3 | 23.1 |
| Chemotherapy & radiotherapy | 1 | 7.7 |
| Chemotherapy | 3 | 23.1 |
| Surgery | 1 | 7.7 |

Table 2. Univariate Analysis

| No | Variable | Means | Median | Min-Max | Std. Deviation |
|----|---------------------|-------|--------|---------|----------------|
| 1. | Fatigue week score1 | 39.77 | 31.00 | 81-12 | 21,363 |
| 2. | Fatigue week score2 | 20.31 | 12.00 | 57-0 | 19,512 |
| 3. | Fatigue week score3 | 14.46 | 0.00 | 69-0 | 23,951 |

Table 3. Identifying Application of WEP in Reducing Cancer-Related Fatigue

| Source | Type III sum of squares | Df | Mean square | F | Sig |
|--------------------|--------------------------------|-----------|--------------------|----------|------------|
| Sphericity Assumed | 4564769 | 2 | 2282,385 | 10,803 | 0.00 |
| Greenhouse-Geiser | 4564769 | 1,304 | 3501299 | 10,803 | 0.03 |

life for cancer patients (Dennett et al., 2016). The Walking Exercise Program is a straightforward physical activity that patients may perform at home or in a hospital and is easier for them to do than other forms of exercise (Tsianakas et al., 2017; Wang et al., 2020). This study used the Walking Exercise Program to

reduce Cancer-Related Fatigue, administered to 13 respondents once a week for three weeks for 30 minutes to treat patients' fatigue. The program produced positive results, with the patient's fatigue level decreasing from 39.77 in the first week to 20.31 in the second week and 14.46 in the third week, indi-

Table 4. Paired-Wise Comparison Test Results

| (i) time | (J) time | Mean Difference (IJ) | std. Error | Sig. b | 95% Confidence Interval for Difference | |
|----------|----------|----------------------|------------|--------|--|-------------|
| | | | | | Lower Bound | Upper bound |
| 1 | 2 | 19,462* | 6,844 | .044 | .439 | 38,484 |
| | 3 | 25,308* | 6,460 | .006 | 7,351 | 43,264 |
| 2 | 1 | -19,462* | 6,844 | .044 | -38,484 | -.439 |
| | 3 | 5,846 | 2,989 | .022 | -2,462 | 14,154 |
| 3 | 1 | -25,308* | 6,460 | .006 | -43,264 | -7,351 |
| | 2 | -5,846 | 2,989 | .222 | -14,154 | 2,462 |

cating that the application of the walking exercise program was effective in treating patients' fatigue.

According to research by (Rufaida et al., 2020b), the Walking Exercise Program has been identified as one of the most successful therapies to alleviate cancer-related fatigue, making it a potential substitute for pharmaceutical therapy. Cancer patients undergoing treatment may benefit from the walking exercise program since it can stabilize resting rhythm activities and enhance sleep quality, both of which can help minimize fatigue.

Exercises like walking regularly can help lessen side effects of medication like weariness. Additionally, it helps elevate one's attitude and confidence. Walking regularly might enhance mental health and creativity. This is so that exercise can boost oxygen levels and hasten blood flow to the brain. In addition, it can decrease aggression and lower tension and anxiety (Damayanti et al., 2020).

A well-known cornerstone intervention for metabolic regulation is the walking exercise program. Muscular muscles are the primary body tissues for insulin-stimulated glucose absorption, fat oxidation, and the use of 80% glucose due to insulin-stimulated circumstances. An insulin-independent mechanism can boost muscle glucose absorption by up to 20-100 times, improving metabolism. Cancer patients may experience less weariness due to these many processes, including raising hemoglobin and cardiac output, increasing oxygen flow, and raising metabolism (Damayanti et al., 2020).

The level of weariness among cancer patients receiving treatment significantly decreased once the Walking Exercise Program (WEP) was put into place. Bivariate analysis's findings show that the Greenhouse-Geiser value has a significance value of 0.03, indicating that the Walking Exercise Program (WEP) can have an impact in lowering cancer pa-

tients' levels of fatigue. This is the foundation for implementing WEP as one of the medicines to treat cancer patients with CRF.

Researchers discovered that administering the strolling Exercise Program (WEP), which involved leisurely strolling for 30 minutes once a week for three weeks, lowered the degree of Cancer Related Fatigue (CRF) in cancer patients receiving therapy. We can utilize WEP as a CRF reducer since it is more practical and straightforward for responders to employ daily. Because tiredness may be overcome from multiple aspects, including physical, mental, and psychological weariness, using WEP in combination with other therapies like psychosocial therapy will reduce the fatigue level more.

CONCLUSION

Positive results were obtained from the research on 13 respondents by applying the Walking Exercise Program (WEP) in Reducing Cancer-Related Fatigue (CRF), which was administered once a week for three weeks. The patient's perceived fatigue score in the first week was 39.77; in the second week, it was 20.31; and in the third week, it was 14.46, indicating that the application of the WEP was practical. According to this result, walking exercise can be an effective program for cancer patients to reduce fatigue, and it is suggested as a routine activity at home to maintain the patient's condition. According to this result, walking exercise can be an effective program for cancer patients to reduce fatigue, and it is suggested as a routine activity at home to maintain the patient's condition. It can be added for further research to take more samples and provide a control group for the study. We recommend that health providers provide a combination of walking exercise and relaxation at the end of intervention as a treat-

ment to relieve fatigue in cancer patients.

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