



## THE EFFECT OF WALKING EXERCISE PROGRAM (WEP) TO DECREASE CANCER RELATED FATIGUE (CRF) IN CHILDREN WITH LEUKEMIA

**Dini Maulinda<sup>1</sup>, Angga Arfina<sup>2</sup>, Eka Malfasari<sup>3</sup>**

<sup>1</sup>Nursing Study Program, STIKes Payung Negeri Pekanbaru, Jl Tamtama No.6 Labuhbaru  
Email: maulindadini@gmail.com

<sup>2</sup>Nursing Study Program, STIKes Payung Negeri Pekanbaru, Jl Tamtama No.6 Labuhbaru  
Email: angga\_arfina@yahoo.com

<sup>3</sup>Nurse Professional Study Program, STIKes Payung Negeri Pekanbaru, Jl Tamtama No.6  
Labuhbaru  
Email: mizzeka18@gmail.com

### *Abstract*

*Cancer Related Fatigue (CRF)* in children with leukemia is one of the complaints that is often experienced due to the effects of chemotherapy. One of the actions that can be done to reduce it is through the Walking Exercise Program (WEP). WEP is a program *exercise* developed based on the principles of frequency, duration, intensity, and activity. The purpose of this study was to determine the effect of physical exercise WEP on *fatigue* in children with leukemia with the design "*Quasy Experimental Pretest-Posttest without control*". The population of this study were all children with leukemia in YKAKI Riau with a total sample of 30 respondents by considering inclusion and exclusion criteria. The data analysis used was univariate and bivariate analysis with the test *Wilcoxon* to compare *fatigue* between before and after the intervention. The results showed that the average fatigue of children with leukemia before getting intervention was 3.53 (SD 2.763; 95% CI 2.50-4.57) and the average fatigue of children with leukemia after receiving intervention was 1.23 (SD 1.104; 95% CI.82) -1.65). Based on the results of the test analysis *Wilcoxon*, the value was *significance* 0.000 ( $p < 0.05$ ), thus there was a significant difference in fatigue between before the intervention and after the intervention was given. The recommendation from the results of this study is that WEP can be used as an intervention in providing nursing care to children with leukemia to reduce fatigue.

*Key words: Cancer related fatigue, WEP, leukemia*

### INTRODUCTION

Fatigue is a common symptom that occurs in cancer patients and occurs almost extensively in patients receiving chemotherapy, radiation therapy, bone marrow transplantation, or medications that can alter the biological response (Berger et al. al., 2010; Kaushal et al., 2013) stated that fatigue is a major complaint in cancer patients, especially patients undergoing chemotherapy. Fatigue, pain, and sleep disturbances are the complaints most frequently complained by children and who

are undergoing cancer treatment (Crichton et al., 2015)

Children who suffer from cancer can experience various physical problems that can be caused by the disease and the therapy regimen given. This is a source of suffering for children. Physical problems that often arise in children with cancer include fatigue, pain, cachexia, anemia, and infections (Ball et al., 2014). Nausea, pain, and fatigue was physical complaints most frequently reported child with cancer who were hospitalized (Miller et al., 2011)



Fatigue related to cancer or *Cancer Related Fatigue* (CRF) is defined as a sense of hard doing activities that settled and the experience subjective, which involves physical, cognitive and psychological aspects that can be associated with cancer or cancer treatment and can interfere with functional status. Cancer patients find it difficult to describe fatigue and they express fatigue in various variations such as feeling tired, exhausted, bored, useless, and heavy fatigue (Kaushal et al., 2013). Fatigue can become acute when a person describes extreme fatigue due to physical or mental stress, or chronic if fatigue does not improve through rest and loss of energy to perform functions and activities as usual (Hilarius et al., 2011; Nunes et al., 2014) When fatigue symptoms persist, it will hamper the patient's ability to fully participate in activities.

Therapy is an effort to improve children's motor skills (Hasnita & Hidayati, 2017). *The Walking Exercise Program* (WEP) is a program exercise developed based on the principles of frequency, duration, intensity, and activities suggested by ACSM and several literature reviews that can be carried out to overcome fatigue. This study aims to determine whether there is an effect of physical exercise walking exercise program on fatigue in children with leukemia. Giving the *Walking Exercise Program* (WEP) can increase oxygen cascade (oxygen flow) and metabolism so that changes in the level of fatigue experienced can occur. The planned walking intervention can be used as an easy and inexpensive method to reduce CRF in leukemia patients (Baky & Elhakk, 2017).

This study aims to determine whether there is an effect of physical exercise walking exercise program on fatigue in children with leukemia.

## RESEARCH METHOD

The type of research used in this research is quantitative with a Quasy Experimental design and a *pretest-posttest design without control group design*. In this study, respondents were selected randomly, then the researcher first measured the level of fatigue of the children using the *Fatigue Child-Allen OncologyScale* (FOA-A Scale) to determine the difference in the initial state (*pretest*). Fatigue is defined as a condition felt by the respondent in the form of being tired, tired and helpless, which is continuous, experienced during the chemotherapy process or afterwards and does not go away with rest. After that, intervention will be given, a *walking exercise program* namely by taking a leisurely 12 minute walk that is carried out 5 days per week for 3 weeks, then will be carried out *posttest* to assess the difference in fatigue. The population in this study were children with leukemia in YKAKI, Riau Province. The analysis in this study includes univariate and bivariate analysis with the test *Wilcoxon* to compare between before and after intervention.

## RESULTS AND DISCUSSION

The following are the results and discussion of this study. Before carrying out the bivariate analysis, the researcher conducted a data normality test. The data normality test is a prerequisite for using the parametric *paired t-test*. The data normal distribution test conducted in this study was the *Saphiro Wilk test* because the sample size in this study was less than 50 respondents. The data is declared to be



normally distributed if the probability value on the test results is more than 0.05 ( $p > 0.05$ ). The following table shows the results of the data normal distribution test with the *Saphiro Wilk test*.

**Table 1. Variable Normality Test Results with the Saphiro Wilk Test**

| Variable                    | p-value Saphiro Wilk Test | Information              |
|-----------------------------|---------------------------|--------------------------|
| Fatigue before intervention | 0.021                     | Not normally distributed |
| Fatigue after intervention  | 0.000                     | Not normally distributed |

Based on the analysis of the *Saphiro Wilk test*, it shows that the two variables are not normally distributed, then the researcher transforms the data to these variables and the test results obtained that the data are not normally distributed. Because the data distribution requirements must be normal are not fulfilled, the hypothesis test used is the alternative paired t test, namely the test *Wilcoxon*.

**Table 2. Results of Bivariate Fatigue Analysis Before and After Walking Exercise Program in Children with Leukemia**

| Variable                    | N  | Median (minimum-maximum) | P     |
|-----------------------------|----|--------------------------|-------|
| Fatigue before intervention | 30 | 3.00 (0 - 12)            | 0.000 |

|                            |    |              |  |
|----------------------------|----|--------------|--|
| Fatigue after intervention | 30 | 1.50 (0 - 4) |  |
|----------------------------|----|--------------|--|

Based on the results of test analysis *Wilcoxon* obtained value of *significance* 0.000 ( $p < 0.05$ ), thus it was concluded that there was a significant difference in fatigue between before walking training intervention and after walking exercise

Some literature suggests that there is a positive effect of physical exercise on organ system function, fatigue and well-being. physical exercise in children during and after cancer treatment (Huang & Ness, 2011). Various physical exercise techniques are used to reduce fatigue and improve physical fitness in cancer patients such as aerobic exercise, stretching or strengthening exercises. Aerobic exercise can be defined as sub maximal exercise which is rhythmic, repeating from the kelompok large muscles where the energy needed is supplied by oxygen (Baky & Elhakk, 2017). *The Walking Exercise Program* (WEP) is a program *exercise* developed based on the principles of frequency, duration, intensity, and activities suggested by ASCM and several *literature reviews*.

*Cancer Related Fatigue* (CRF) is one of the most disturbing complaints in AML sufferers and it is reported that most of them undergo chemotherapy. CRF is physical, emotional and / or cognitive fatigue or fatigue that is persistent, subjective in relation to cancer and cancer involvement. One of the causes of stress can occur due to hospitalization (Astuti & Merdekawati, 2016; Malfasari et al., 2018). This can interfere with the activities of daily life. many patients report CRF for



months or even years even though cancer treatment has been completed. There is no exact drug that can prevent or treat CRF, but several studies have shown that physical exercise or aerobic exercise can help reduce CRF and improve quality of life (Gheyasi et al., 2019).

The results of the test analysis *Wilcoxon* obtained value of *significance* 0.000 ( $p < 0.05$ ), thus it was concluded that there was a significant difference in fatigue between before the walking exercise intervention and after being given walking training. Aerobic exercise activities including walking, cycling, swimming, jogging are recommended exercises. Walking is one of the most accessible and easy to do exercises of all. A preliminary study conducted by (Chiang et al., 2009) showed that CRF levels were lower in AML sufferers who performed walking activities for 3 weeks. This is also supported by research conducted by (Wenzel et al., 2013) which states that walking can reduce CRF and emotional distress (Gheyasi, et al., 2019).

Children who are hospitalized during chemotherapy often wake up at night which can contribute to fatigue. In addition, the effects of chemotherapy cause children to need adequate rest time. This results in reduced physical exercise which affects muscle function. When muscles are inactive, the enzyme content in the mitochondria and muscle capillary density decreases. Myofibrils become thinner which indicates muscle atrophy, muscle fibers needed for activity are lost. Researchers identified sedentary habits and muscle atrophy as one of the factors that contribute to fatigue (Hooke et al., 2011).

Fatigue is a common symptom in children during and after cancer treatment.

Fatigue can be reduced by doing physical activity. The research of Yeh et al. Reported a decrease in fatigue in children with ALL who did aerobic exercise for 6 weeks compared to the control group ( $P = 0.03$ , Cohen'sd = 0.54). This is also supported by the results of research conducted by Keats and Culos-Reed which also showed a reduction in fatigue ( $P = 0.01$ , Cohend'sd = 0.69) in children who did physical activity for 16 weeks (*Walking Exercise Program* (WEP) (Huang & Ness, 2011). Administration can increase the *oxygen cascade* (oxygen flow) and metabolism so that changes in the level of *fatigue* experienced can occur. The planned walking intervention can be used as an easy and inexpensive method to reduce CRF in leukemia patients.

## CONCLUSION

Based on the results of research conducted on children with leukemia in YKAKI, Riau Province on 30 respondents consisting of 16 male respondents (53.3% ) and 14 female respondents (46.7%) with the type of leukemia ALL (100%) at school age (76.6%) and adolescents (23.3%) there were significant differences in reducing fatigue before and after intervention *walkingExercise Program* (WEP). The results of the test analysis *Wilcoxon* showed value of *significance* 0.000 ( $p < 0.05$ ). The recommendation of this study is that WEP can be used as an intervention in providing nursing care to children with leukemia to reduce fatigue.

## ACKNOWLEDGMENTS

The author would like to thank the Directorate of Research and Community



Service for Higher Education (DRPM DIKTI) who funded this research. Furthermore, we would like to thank LPPM STIKes Payung Negeri Pekanbaru for supporting the implementation of this research.

## REFERENCES

- Astuti, A., & Merdekawati, D. (2016). THE EFFECT OF CLASSICAL MUSIC THERAPY ON THE DECREASE OF PATIENT'S POST OPERATING PAIN SCALE. *Journal of Applied Science*, 10(3), 148–154. <https://doi.org/10.22216/jit.2016.v10i3.526>
- Baky, A., & Elhakk, S. (2017). Impact of Aerobic Exercise on Physical Fitness and Fatigue In Children with Acute Lymphoblastic Leukemia. *International Journal of Therapies and Rehabilitation Research*, 6(2), 137. <https://doi.org/10.5455/ijtrr.000000255>
- Ball, JW, Bindler, RC, Bindler, RM, & Cowen, KJ (2014). *Child Health Nursing: Partnering with Children and Families*. Pearson.
- Berger, AM, Abernethy, AP, Atkinson, A., Barsevick, AM, Breitbart, WS, Cella, D., Cimprich, B., Cleeland, C., Eisenberger, MA, Escalante, CP, Jacobsen, PB, Kaldor, P., Ligibel, JA, Murphy, BA, O'Connor, T., Pirl, WF, Rodler, E., Rugo, HS, Thomas, J., & Wagner, LI (2010). NCCN Clinical Practice Guidelines Cancer-related fatigue. *Journal of the National Comprehensive Cancer Network: JNCCN*, 8(8), 904–931. <https://doi.org/10.6004/jnccn.2010.0067>
- Chiang, YC, Yeh, CH, Wang, KWK, & Yang, CP (2009). The experience of cancer-related fatigue in Taiwanese children. *European Journal of Cancer Care*, 18(1), 43–49. <https://doi.org/10.1111/j.1365-2354.2007.00884.x>
- Crichton, A., Knight, S., Oakley, E., Babl, FE, & Anderson, V. (2015). Fatigue in Child Chronic Health Conditions: A Systematic Review of Assessment Instruments. *PEDIATRICS*, 135(4), e1015 – e1031. <https://doi.org/10.1542/peds.2014-2440>
- Gheyasi, F., Baraz, S., Malehi, A., Ahmadzadeh, A., Salehi, R., & Vaismoradi, M. (2019). Effect of the Walking Exercise Program on Cancer-Related Fatigue in Patients with Acute Myeloid Leukemia Undergoing Chemotherapy. *Asian Pacific Journal of Cancer Prevention*, 20(6), 1661–1666. <https://doi.org/10.31557/APJCP.2019.20.6.1661>
- Hasnita, E., & Hidayati, TR (2017). Occupational Therapy for Fine Motor Development in Children with Autism. *Journal of Applied Science Technology and*, 9(1), Article 1. <https://doi.org/10.22216/jit.2015.v9i1.25>
- Hilarius, DL, Kloeg, PH, Wall, EVD, Komen, M., Gundy, CM, & Aaronson, NK (2011). Cancer-related fatigue: Clinical practice versus practice guidelines. *Supportive Care in Cancer*, 19(4), 531–538.



- <https://doi.org/10.1007/s00520-010-0848-3>
- Hooke, MC, Garwick, AW, & Gross, CR (2011). Fatigue and Physical Performance in Children and Adolescents Receiving Chemotherapy. *Oncology Nursing Forum*, 38(6), 649–657. <https://doi.org/10.1188/11.ONF.649-657>
- Huang, T.-T., & Ness, KK (2011). Exercise Interventions in Children with Cancer: A Review. *International Journal of Pediatrics*, 2011, 1–11. <https://doi.org/10.1155/2011/461512>
- Kaushal, DB, Narendra, BD, & Smitha, D. (2013). A Comparative Study between Relaxation Technique and Aerobic Exercise in Fatigue During Chemotherapy in Acute Lymphoblastic Leukemia in Children. *Indian Journal of Physiotherapy & Occupational Therapy-An International Journal*, 7(3), 140-145–145.
- Malfasari, E., Devita, Y., Erlin, F., & Ramadania, I. (2018). Hospital Environment and Students' Anxiety Level While Doing Clinical Practice. *Journal of the Indonesian National Nurses Association (JPPNI)*, 2(2), 117–125. <https://doi.org/10.32419/jppni.v2i2.89>
- Miller, E., Jacob, E., & Hockenberry, MJ (2011). Nausea, pain, fatigue, and multiple symptoms in hospitalized children with cancer. *Oncology Nursing Forum*, 38(5), E382-393. <https://doi.org/10.1188/11.ONF.E382-E393>
- Nunes, M., Silva, M., Rocha, E., Lima, R., & Nascimento, L. (2014). Measurement of fatigue in children and adolescents with cancer: An integrative review. *Texto & Contexto - Enfermagem*, 23, 492–501. <https://doi.org/10.1590/0104-07072014003960011>
- Wenzel, JA, Griffith, KA, Shang, J., Thompson, CB, Hedlin, H., Stewart, KJ, DeWeese, T., & Mock, V. ( 2013). Impact of a Home-Based Walking Intervention on Outcomes of Sleep Quality, Emotional Distress, and Fatigue in Patients Undergoing Treatment for Solid Tumors. *The Oncologist*, 18(4), 476–484. <https://doi.org/10.1634/theoncologist.2012-0278>