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# EFFECTIVENESS OF REPRODUCTIVE HEALTH EDUCATION THROUGH LEAFLETS AND PERSONAL HYGIENE PRACTICES ON MENSTRUAL KNOWLEDGE AND BEHAVIOR OF VOCATIONAL SCHOOL STUDENTS IN WEST JAVA

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***Abstract***

Hemodialysis is a kidney replacement therapy that must be performed regularly and long-term. Fatigue is a major clinical problem frequently experienced by patients with chronic kidney disease (CKD) undergoing hemodialysis. This condition is chronic and multifactorial, characterized by decreased physical energy, impaired concentration, low motivation, and limitations in performing daily activities. Fatigue not only reduces patients' quality of life but also contributes to poor therapy adherence, psychosocial disorders, and an increased risk of long-term complications. Method this study used a quantitative approach with a one-group pretest-posttest design, involving one group of hemodialysis patients who received acupressure therapy intervention. Respondents' fatigue levels were measured before and after acupressure administration to assess the intervention's effectiveness in reducing fatigue. To determine the effectiveness of acupressure in reducing fatigue levels in patients with chronic kidney disease undergoing hemodialysis at Anna Medika Hospital, North Bekasi in 2025. Results the analysis of the effectiveness of acupressure in reducing fatigue in hemodialysis patients at Anna Medika Hospital in 2025. The data showed a p-value of 0.028 (p-value <0.05), indicating a significant effect of acupressure on reducing fatigue in hemodialysis patients at Anna Medika Hospital in 2025 before and after the intervention. Discussion acupressure therapy has been proven effective in reducing fatigue in hemodialysis patients at Anna Medika Hospital in 2025. The results of this study are expected to inform the development of a socialization program, specifically "Acupressure for Reducing Fatigue in Hemodialysis Patients," which can be implemented in hospitals to reduce dependence on medication or pharmacological therapy.

**Keywords:** Acupressure, Fatigue, Hemodialysis



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## INTRODUCTION

Hemodialysis is a kidney replacement therapy that must be performed regularly and long-term. Fatigue is a major clinical problem frequently experienced by patients with chronic kidney disease (CKD) undergoing hemodialysis. This condition is chronic and multifactorial, characterized by decreased physical energy, impaired concentration, low motivation, and limitations in performing daily activities. Fatigue is a major clinical problem frequently experienced by patients with chronic kidney disease (CKD) undergoing hemodialysis. This condition is chronic and multifactorial, characterized by decreased physical energy, impaired concentration, low motivation, and limitations in performing daily activities. Fatigue not only reduces patients' quality of life but also contributes to poor therapy compliance, psychosocial disorders, and an increased risk of long-term complications (Park et al., 2021; Zhang et al., 2023). In Indonesia, the number of patients with chronic kidney disease undergoing hemodialysis continues to increase annually. Basic Health Research (Riskesdas) data, supported by the Indonesian Renal Registry report, shows that the number of active hemodialysis patients has exceeded 185,000, increasing by approximately 10–12% per year. Fatigue is one of the most frequently reported complaints, impacting decreased daily activity, sleep disturbances, and psychological problems such as anxiety and depression (PERNEFRI, 2023). Concurrently, complaints of moderate to severe fatigue after hemodialysis are common among patients. Untreated fatigue can decrease adherence to hemodialysis schedules, fluid restrictions, and diet, as well as increase the risk of metabolic complications and readmissions, highlighting the importance of effective supportive interventions in healthcare facilities (Putri et al., 2023). The Global Burden of Disease report also confirms that the increasing global burden of chronic kidney disease has a significant impact on patient functional capacity and productivity. Clinically, fatigue in hemodialysis patients is influenced by anemia, metabolic disorders, blood pressure fluctuations, prolonged therapy, and a lack of structured supportive interventions, necessitating a more comprehensive management approach (GBD, 2023; Park et al., 2021).

Acupressure is a non-pharmacological complementary therapy performed by applying pressure to specific acupuncture points associated with the regulation of organ and nervous system function. Physiologically, acupressure activates the parasympathetic nervous system, improves microcirculation, and stimulates the release of endorphins and serotonin, which play a role in reducing the perception of fatigue and increasing bodily well-being (Li et al., 2021; Zhang et al., 2023). Various international studies have shown that acupressure is effective in reducing fatigue levels. A study in China reported that structured stimulation of the ST36, SP6, and LI4 points reduced fatigue through neuroendocrine modulation mechanisms. Similar findings were reported in South Korea, where routine acupressure was shown to improve physical endurance and daily activity in hemodialysis patients (Li et al., 2021; Zhang et al., 2023; Park et al., 2021). Hemodialysis patients experiencing fatigue often appear clinically stable, but experience persistent and prolonged decreased energy. This condition is associated with anemia, chronic inflammation, metabolic disorders, uremic toxin accumulation, and psychological stress from chronic disease and dependence on dialysis therapy. Advanced age, prolonged hemodialysis, and poor sleep quality contribute to patient fatigue (Bossola, 2023). Fatigue in hemodialysis patients is generally characterized by easy fatigue during light activity, muscle weakness, a feeling of heaviness in the extremities, excessive sleepiness, decreased stamina, and slow energy recovery after the hemodialysis procedure (Bossola, 2023).

Fatigue is often accompanied by impaired concentration, memory impairment, slowed thought processes, and decreased motivation. Emotionally, patients can experience feelings of lethargy, irritability, anxiety, and mild to moderate depression that exacerbate the perception of fatigue. At an advanced stage, fatigue impacts limitations in daily activities, decreased independence, and impaired social functioning, including the ability to work and interact, which leads to a decrease in the patient's overall quality of life.

## METHODS

This study used a quantitative approach with a one-group pretest–posttest design, involving one group of hemodialysis patients who were given

acupressure therapy intervention. Respondents' fatigue levels were measured before and after acupressure administration to assess the intervention's effectiveness in reducing fatigue at the research location at Anna Medika Hospital in the hemodialysis service unit with a total of 86 respondents..

**Study design and setting**

This study used a quantitative approach with a one-group pretest-posttest design, involving one group of hemodialysis patients who received acupressure therapy intervention. Respondents' fatigue levels were measured before and after acupressure administration to assess the intervention's effectiveness in reducing fatigue. To determine the effectiveness of acupressure in reducing fatigue levels in patients with chronic kidney disease undergoing hemodialysis at Anna Medika Hospital, North Bekasi in 2025.

**Population and smple**

The population used in this study were patients undergoing hemodialysis throughout 2025 with a total of 595 patients. The sampling technique in this study was using random sampling technique. To determine the minimum sample based on the Slovin formula, and the sample obtained in this study was 86 people.

**Instrument**

The data collection method in this study involved the use of primary data obtained through pre-post tests with respondents at anna medika hospital Bekasi City. This was to ensure a systematic data collection process.

**Data collection procedure**

The data collection method in this study involved the use of primary data obtained through pre-posttests with respondents at anna medika Hospital in Bekasi City.To ensure a systematic data collection process, this study was conducted in three stages: preparation, implementation, and evaluation.

**Data analys**

This analysis aims to test the research hypothesis proposed by the researcher. The statistical test used depends on the type of data, whether categorical or numeric. Furthermore, the t-test was used to determine whether the data were paired (dependent) or unpaired (independent). This study used an experimental t-test, as this was an experimental study with a pre-test and post-test method. Therefore, the data compared were derived from pre- and post-treatment measurements to determine significant differences in averages.

Bivariate analysis in this study was used to analyze the relationship between two different variables. In the context of this thesis, the purpose of the bivariate analysis was to determine the difference in fatigue levels of hemodialysis patients before and after acupressure therapy intervention. The results of the homogeneity test showed a significance value (sig.) of 0.177, which is greater than 0.05 (sig. > 0.05). Therefore, the data can be concluded as homogeneous.

The results of the normality test using the Kolmogorov-Smirnov test showed a significance value of 0.006 for the pre-test and 0.023 for the post-test (p > 0.05). Thus, the data is not normally distributed so that bivariate analysis can be continued using the Shapiro-Wilk test.

**Ethical Considerations**

This study adhered to ethical research principles, including respect for persons, beneficence, non-maleficence, and justice. All respondents were given clear information and signed informed consent. Respondent identity confidentiality was maintained, and the intervention provided posed no risk to the participants.

## RESULT AND DISCUSSION

A total of 86 respondents who received treatment at the Hemodialysis Clinic at Anna Medika Hospital received intervention.

1. *Distribution of data before treatment (Pretest)*

| ***fatigue*** | **Frequences (n)** | **Percent (%)** |
|---|---|---|
| Mild Fatigue | 4 | 2,3% |
| Modarte Fatigue | 49 | 28,5% |
| Severe Fatigue | 33 | 19,2% |
| **Total** | **86** | **100,0** |

*Based on the results of the study of 86 respondents, the results of the pretest data showed that 4 respondents (2.3%) had mild fatigue, while 49 respondents (28.5%) had moderate fatigue. Finally, 33 respondents (19.2%) had severe fatigue*

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2. *Data distribution after conducting (Posttest)*

| ***fatigue*** | **Frequences (n)** | **Percent (%)** |
|---|---|---|
| Mild Fatigue | 6 | 3,5% |
| Modarte Fatigue | 53 | 30,8% |
| Severe Fatigue | 27 | 15,7% |
| **Total** | **86** | **100,0** |

Based on the results of the study of 86 respondents, the post-test data showed that 6 respondents (3.5%) had mild fatigue, while 53 respondents (30.8%) had moderate fatigue. Finally, 27 respondents (15.7%) had severe fatigue.

3. *Results of Bivariate Analysis of Knowledge and Behavior*

| **Variabel** | **Mean** | **Negatif ranks** | **Positif ranks** | ***P Value*** |
|---|---|---|---|---|
| *Kelelahan Pretest* | 25,13 | 52 | 31 | 0,028 |
| *Kelelahan Postest* | 23,50 | | | |

Based on the table above, it can be seen that the mean value for each pretest was 25.13, while for the posttest it was 23.50. The Negative Rank value (52 respondents) was greater than the Positive Rank value (31 respondents), indicating a significant change in scores before and after the intervention.

The Wilcoxon Signed Ranks Test results showed a p-value of 0.028, with a p-value interpretation of $<\alpha$ ($0.028 < 0.05$). This means that the Ha decision is accepted and Ho is rejected. Therefore, it can be concluded that there is a significant effect of Acupressure Therapy on the fatigue level of hemodialysis patients at Anna Medika Hospital, Bekasi.

**Discussion**

Based on the results of a study of 86 respondents, the pretest data showed that respondents with moderate fatigue were more dominant, followed by severe fatigue, followed by mild fatigue. According to the developing theory, patients undergoing hemodialysis experience various physiological changes due to decreased kidney function and repeated dialysis processes. Protein and energy metabolism disorders often occur, characterized by increased muscle catabolism and decreased body energy reserves, which directly contribute to the emergence of chronic fatigue in hemodialysis patients (Triyanti et al., 2018).In addition, the ultrafiltration process in hemodialysis can cause fluid imbalances and rapid hemodynamic changes, such as intradialytic hypotension, muscle cramps, and postdialysis weakness, thereby reducing physical tolerance and exacerbating patient fatigue (Sitorus et al., 2023)Research by (Togatorop & , Dudut Tanjung, 2023) stated that fatigue in hemodialysis patients not only impacts physical function decline, but also increases the risk of sleep disorders, depression, decreased motivation, and dependence on self-care. Patients experiencing depression can increase the incidence of fatigue in patients with chronic kidney failure. Fatigue can negatively impact overall quality of life during hemodialysis, with an increased degree of fatigue worsening the patient's quality of life across all dimensions. Research by (Dewi Diniyatul Maulidiyah, Murtaqib, 2024) suggests that fatigue in hemodialysis patients can be caused by psychological disorders such as stress or depression. Hemodialysis is a beneficial therapy for replacing damaged kidney function in patients with chronic kidney failure. However, hemodialysis therapy also has several side effects, one of which is fatigue.

Based on the study, the post-test data showed that respondents with moderate fatigue increased compared to the previous period. This occurred because patients with severe fatigue decreased, and patients with mild fatigue also improved after the intervention. According to the theory developed in exercise, many physiological changes occur due to the adaptation process of various systems within the body. Adaptation to exercise in the body system will show many physical and biochemical changes in the vascular, cardiovascular, respiratory, and muscular systems. Regular physical exercise has the benefit of improving muscle health by stimulating the growth of small blood vessels (capillaries) in the muscles. According to research conducted by (Diyanto et al., 2023) acupressure therapy has been proven effective in improving the quality of life or reducing fatigue in patients with chronic kidney failure during hemodialysis. Acupressure is an effective intervention in improving the quality of life of hemodialysis patients. Acupressure has been shown to reduce symptoms of depression, anxiety, fatigue, and sleep disorders, as well as improving the physical, psychological, and environmental quality of life of patients. Meanwhile, research conducted by (Sulistini & Yetti, 2008) found that administering acupressure has a very significant effect on reducing fatigue in hemodialysis patients, so that acupressure therapy can be a complementary therapy that can reduce complaints of fatigue in hemodialysis patients. According to the developing theory, acupressure is related to the gate control theory, namely by applying pressure to body points, the nervous system can induce alpha wave stimuli in the brain, causing relaxation and reducing fatigue. Acupressure therapy is a safe and easy complementary therapy to do, and has effects that can increase blood circulation, remove metabolic waste, increase joint movement, eliminate pain, relax muscles and provide a pleasant feeling to the patient.

The effectiveness of acupressure on reducing fatigue in hemodialysis patients at Anna Medika Hospital in 2025. It is known that the results of the data obtained there is a significant influence between Acupressure on Reducing Fatigue in Hemodialysis Patients at Anna Medika Hospital in 2025 before and after the intervention. A person who is given therapy will get a relaxing effect and can stimulate the release of endorphins and decrease activity in the sympathetic and parasympathetic nervous systems. As a result, peripheral nerves are stimulated, peripheral skin circulation is increased by the sympathetic nervous system so that a relaxation response occurs in the muscles, blood flow to the blood vessels widens and will create a feeling of comfort, a refreshing and relaxing effect, and can reduce fatigue in heart failure patients. According to (Ningsih et al., 2025) it is known that there is an effect of reducing the level of fatigue from severe to moderate after being given acupressure in CKD patients undergoing hemodialysis. Fatigue can occur due to insufficient nutritional needs so that the body's energy needs are not met. Fatigue can appear several days after chemotherapy treatment and gets worse. Clients also said that after chemotherapy they experienced a decrease in blood (anemia). Clients receiving chemotherapy experience anemia due to reduced red blood cell production so that oxygen binding in the blood is reduced so the body will feel weak even though they are not doing any activity. fatigue experienced within 24 hours during chemotherapy and the most severe is felt, Prolonged fatigue interferes with routine work such as main work and daily activities at home. According to research conducted by (Togatorop & , Dudut Tanjung, 2023)added regarding the effectiveness of acupressure that the administration of acupressure is effective in reducing fatigue levels in patients undergoing chemotherapy with a significance value of p-value = <0.05. According to the developing theory Acupressure is related to the gate control theory, namely by applying pressure to body points through the nervous system it can induce alpha wave stimuli in the brain, causing relaxation and reducing fatigue, acupressure therapy is a safe and easy companion therapy to do, and has effects that can improve blood circulation, remove metabolic waste, increase joint movement, relieve pain, relax muscles and provide a pleasant feeling to the patient. According to the researcher's assumption, this technique is very influential in reducing the level of fatigue in patients with hemodialysis or other treatments such as cancer and chemotherapy, this occurs because Acupressure is done by using a pleasant light touch as at certain points. According to Traditional Chinese Medicine (TCM) Theory, this action can improve health by restoring the smooth flow of energy.

**Conflict of Interest**

The authors declare no conflict of interest.

**Availability of data and materials**

Research data is available from the primary author upon reasonable request

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