

# Dry Cupping Therapy as A Complementary Approach to Reduce Fatigue in Hemodialysis Patients: A Quasi-Experimental Study in Indonesia

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**Abstract.** Fatigue is common symptom experienced by patients with chronic kidney disease (CKD) undergoing hemodialysis. This study aimed to identify the effect of dry cupping therapy on the fatigue levels of hemodialysis patients at Bendan Hospital, Pekalongan City, Indonesia. The study design used was quasi-experimental design with a control group. Thirty patients were selected through convenience sampling, with 15 patients in the intervention group and 15 patients in the control group. The intervention group received dry cupping therapy twice a week for five weeks, while the control group received health education on how to cope with fatigue. Fatigue levels were measured using the Indonesian version of FACIT Fatigue scale. The results showed that there was a difference in fatigue scores in the intervention group, from 22.40 to 28.73 ( $p < 0.001$ ). Meanwhile, the control group showed no significant change in score before and after, from 23.33 to 23.20 ( $p > 0.001$ ). These findings indicate that dry cupping can reduce fatigue levels in chronic kidney failure patients undergoing hemodialysis. These results can be considered by nurses in integrating complementary nursing into patient care in hospitals.

**Keywords:** Chronic kidney disease, Dry cupping, Fatigue, Hemodialysis.

## 1 Background

Chronic kidney disease (CKD) is a chronic disease that is difficult to cure. This disease is characterized by the inability of the kidneys to maintain metabolic and fluid-electrolyte balance, resulting in the accumulation of urea and nitrogen in the blood. The management of chronic kidney disease includes hemodialysis, continuous ambulatory peritoneal dialysis (CAPD), and kidney transplantation. Chronic kidney disease is the leading cause of death

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worldwide. The mortality rate caused by chronic kidney disease is projected to increase by 42% by 2040 (1).

The incidence of CKD in Indonesia continues to increase. The results of the 2018 Basic Health Research showed 713,783 cases, with the highest number on the island of Java. Central Java alone reported 13,886 patients, and there were 107 patients at Bendan Hospital, Pekalongan, undergoing hemodialysis in November.

Dry cupping therapy is a complementary therapy that is easy to administer and has also no harmful side effects. Complementary therapies are regulated by Minister of Health Regulation No. 15 of 2018 which stipulates that complementary therapies administered to patients must be safe, scientifically accountable, and beneficial (2). Research shows that dry cupping can reduce fatigue in patients with chronic fatigue syndrome and improve symptoms of carpal tunnel syndrome when combined with physiotherapy. In addition, dry cupping can increase vasodilatation, circulation, and activate the healing process (3).

Hemodialysis is a procedure that replaces kidney function, and it must be performed continuously throughout the patient's lifetime (4). Hemodialysis is performed twice a week, with each session lasting 4-5 hours. Long-term treatment causes physical, psychological, emotional, and social burdens. Fatigue is one of the most common symptoms experienced by patients undergoing long-term treatment. Fatigue can be caused by factors such as electrolyte imbalance, anemia, uremia, anxiety, and depression. Research also shows that fatigue correlates with age, gender, and duration of hemodialysis, causing patients to experience difficulties in performing daily activities (5).

Addressing fatigue is crucial for improving concentration, sleep quality, emotional stability, and performing daily activities. Fatigue can be addressed by administering medications such as folic acid, erythropoietin, and iron supplementation. Meanwhile, non-pharmacological interventions- such as Benson relaxation, deep breathing, progressive muscle relaxation, massage, reading the Qur'an, and cupping therapy- have been proven effective in reducing fatigue (6).

A preliminary study at Bendan Hospital showed that patients who had undergone haemodialysis for more than one-year experienced higher levels of fatigue compared to patients who had undergone treatment for less than one year. Meanwhile, new patients more often showed psychological problems such as denial, stress, anxiety, and depression. Dry cupping therapy had never been studied at this hospital, so this research was considered important to conduct. The objective of this study was to identify the effect of dry cupping therapy in reducing fatigue levels in chronic kidney disease patients undergoing hemodialysis.

## **2 Research Methods**

### **2.1 Study Design**

This research used a quasi-experimental design with a pre- test and post- test approach and control group. Though this design, the researcher were able to compare changes in fatigues scores between those who received that intervention and those in control group.

### **2.2 Study Setting and Duration**

The study was conducted at Bendan Regional General Hospital. This is in Pekalongan City, Central Java, Indonesia. It was conducted from January to March 2025.

## **2.3 Population and Sample**

This study used purposive sampling, whereby participants were selected based on criteria that were aligned with the study's objectives. A total of 30 participants were selected from a population of 107 hemodialysis patients. The researchers divided the intervention group and the control group based on odd and even numbers when they met with the researchers.

Inclusion and exclusion criteria:

1. Inclusion criteria: Diagnosed with chronic kidney failure, undergoing hemodialysis at least twice a week, aged 18–65 years, able to communicate verbally, and willing to participate in the study.
2. Exclusion criteria: the presence of active skin infection, blood clotting disorders or participation in other interventions with the potential to affect fatigue levels.

## **2.4 Intervention**

Here is a more detailed explanation of the treatment given to the intervention group and the control group.

1. Dry cupping therapy was administered to the intervention group twice weekly for five consecutive weeks, with each session lasting 10-15 minutes. The Al Warik cupping points which are located on the left and right sides of the hips at the intersection of the gluteus maximus and Medius muscle, were used. These points are beneficial for treating kidney problems, lower back pain, irregular menstruation, and urinary disorders. The Al-Warik points was selected base on previous references and research showing that this point is effective in reducing fatigue symptom in patients with chronic conditions and is beneficial for treating reproductive and kidney problems. The cupping procedure began with a sliding cupping technique using olive oil along the left and right sides of the spine. This was followed by dry cupping therapy at the Al Warik point. The equipment used includes a set of cupping tools, olive oil, medical gloves, an instrument tray, and patients' gowns.
2. The control group was given health education on how to overcome fatigue through leaflets.

## **2.5 Measurement Instrument**

Fatigue levels in this study were measured using the Indonesian version of the functional Assessment of Chronic Illness Therapy- Fatigue Scale (FACIT-Fatigue) Version 4. The measurement tool consists of 13 items designed to evaluated fatigue and its impact on daily activities and functioning in patients with chronic illness, including that undergoing hemodialysis. Each item is rated on a 5-point Likert scale, with total scores ranging from 0 to 52- higher scores indicate lower levels of fatigue.

## **2.6 Validity and Reliability**

The Indonesian version of the FACIT-Fatigue Scale used in this study has been validated in previous research. The results of the analysis show that all items are valid, with an r-table of 0.278. Meanwhile, the reliability test results show a Cronbach's alpha of 0.646, indicating that this instrument is reliable.

## 2.7 Ethical Considerations

Ethical approval for this study was granted by the Health Research Ethics Committee of Pekalongan University (Approval No. 001/B.02.01/KEPK/I/2025). All participants provided written informed consent before taking part in the study.

## 2.8 Data Analysis

Data analysis in this study used IBM SPSS Statistics version 26. The Shapiro-Wilk test was used to test data normality. To determine the difference in fatigue levels between the intervention group and the control group, a paired t-test was used. Meanwhile, to compare the differences between the intervention group and the control group after the intervention, an independent t-test was used.

## 3 Results

### 3.1 Participant Characteristics

Table 1 describes the characteristics of participants in both the intervention and control groups. Most participants in the intervention group were aged 56-65 years (40.0%), female (53.3%), had undergone hemodialysis for 7-10 years (60.0%), and were unemployed (86.7%). In the control group, most were aged 46-55 years and 56-65 years (33.3% each), male (66.7%), had undergone hemodialysis for 1-3 years (53.3%), and most were unemployed (80.0%).

**Table 1.** Overview of Participant Characteristics in Each Group

Variable	Category	Intervention (n=15)	Control (n=15)
<b>Age (years)</b>	26–35	1 (6.7%)	2 (13.3%)
	36–45	3 (20.0%)	1 (6.7%)
	46–55	4 (26.7%)	5 (33.3%)
	56–65	6 (40.0%)	5 (33.3%)
	66–75	1 (6.7%)	2 (13.3%)
<b>Gender</b>	Male	7 (46.7%)	10 (66.7%)
	Female	8 (53.3%)	5 (33.3%)
<b>Hemodialysis Duration</b>	1–3 years	4 (26.7%)	8 (53.3%)
	4–6 years	2 (13.3%)	5 (33.3%)
	7–10 years	9 (60.0%)	2 (13.3%)
<b>Employment Status</b>	Working	2 (13.3%)	3 (20.0%)
	Not working	13 (86.7%)	12 (80.0%)

Note: Percentages may not total exactly 100% due to rounding

### 3.2 Normality Test

Data normality was tested using the Shapiro-Wilk test. Table 2 shows that all variables have p-values.0.05. this indicates that the data are normally distributes, allowing parametric testing to be performed..

**Table 2.** Shapiro–Wilk Normality Test

Group		Statistic	P value
Intervention	Pre-test	0.910	0.135
	Post-test	0.963	0,742
Control	Pre-test	0.909	0,131
	Post-test	0.909	0,131

### 3.3 Changes in Fatigue Scores Within Groups.

Table 3 shows an increase in the average fatigue score in the intervention group from  $22.40 \pm 2.324$  (pre-test) to  $28.73 \pm 2.374$  (post-test), with a p-value of 0.000. this indicates a decrease in fatigue levels after the dry cupping therapy. Meanwhile, the control group did not show significant changes, with score change from  $23.33 \pm 2.664$  to  $23.20 \pm 2.541$  ( $p = 0.164$ ). the effect size calculated (Cohen’s d) between the intervention group and the control group at post-test was 2.25. this figure indicates a very large effect.

**Table 3.** Pre–Post Comparison of Fatigue Scores (Paired Sample T-Test).

Group		N	Mean Score	SD	p-value
Intervention	Pre-test	15	22.40	2.324	0.000**
	Post-test	15	28.73	2.374	
Control	Pre-test	15	23.33	2.664	0.164
	Post-test	15	23.20	2.541	

Note:  $p < 0.05$  indicates statistical significance

### 3.4 Comparison of Fatigue Scores Between Groups.

Table 4 illustrates the results of the independent t-test showing the difference in fatigue scores between the intervention group and the control group after receiving dry cupping therapy. At baseline, no significant difference was observed between the intervention and control groups ( $p = 0.339$ ). However, after the intervention, a statistically significant difference was found between groups ( $p = 0.000$ ), with the intervention group showing a greater reduction in fatigue.

**Table 4.** Comparison of Fatigue Scores Between Groups (Independent Sample T-Test).

Time Point	Group	Mean	P value
Pre-test	Intervention	22.40	0.339
	Control	23.33	
Post-test	Intervention	28.73	0.000**
	Control	23.20	

Note:  $p < 0.05$  indicates statistical significance

## 4 Discussion

Fatigue is a frequently mentioned symptom that causes distress in individuals undergoing hemodialysis. It is affected by multiple factors, including physiological, psychological, and treatment-related elements (7)

Table 1 reveals that around 20% of the participants are individuals under the age of 45. Some research indicates that chronic illnesses are the reason for their hemodialysis treatment. Examples encompass diabetes mellitus, hypertension, and glomerulonephritis, among others. The condition arises from an unhealthy lifestyle, marked by poor nutrition, lack of physical exercise, and insufficient sleep (8,9). Furthermore, it may also result from genetic anomalies, low socioeconomic level, and an adverse environment .

Older adults are more susceptible to fatigue due to sarcopenia and degenerative conditions. Men are reported to be more prone to fatigue due to smoking and alcoholism. The length of time that hemodialysis takes also makes patients very tired, possibly because the body is under a lot of pressure from long-term treatment. A study found that the level of fatigue and the length of hemodialysis were positively correlated. Patients undergoing extended hemodialysis are susceptible to heightened tiredness severity. A distinct investigation revealed that those receiving hemodialysis for 5-9 years exhibit increased fatigue levels compared to those having hemodialysis for a shorter period (10,11). Furthermore, employed individuals had superior energy levels and psychosocial resilience compared to their unemployed counterparts (12).

This study showed that patients suffering from chronic kidney disease (CKD) who underwent a five-week dry cupping intervention experienced a significant reduction in fatigue levels. The intervention group showed an increase in the average fatigue score from 22.40 to 28.73 ( $p < 0.001$ ), where an increase in the fatigue score means a decrease in patients' fatigue, while the control group showed no significant change. The results of this study indicate that dry cupping therapy is effective in reducing fatigue in patients undergoing hemodialysis.

The mechanism of fatigue reduction enabled by dry cupping therapy can be explained in several ways, such as increased blood circulation, reduced muscle tension, and increase relaxation. Cupping therapy can improve peripheral circulation and vasodilatation through the formation of nitric oxide (NO), thereby increasing tissue oxygenation and accelerating muscle recovery (13). The reduction in fatigue resulting from dry cupping therapy may also be due to stimulation of the para sympathetic nervous system and the release of  $\beta$ -endorphin hormones. These hormones act as natural painkillers that can reduce physical and mental fatigue.

These findings align with those of Chen et al. (2020), who reported that dry cupping was effective in reducing muscle fatigue in the upper extremity (14). Meanwhile, Anargi and Roepajadi (2021) noted that massage techniques were more effective than dry cupping in supporting muscle recovery after physical activity. Differences across studies may be related to variations in participants characteristics, the frequency of the intervention, or the specific type of fatigue being measured (15).

Despite the benefits observed, some participants in the intervention group continued to report moderate levels of fatigue. This indicates that while dry cupping therapy can help reduce fatigue, it may not address all contributing factors. Fatigue in hemodialysis patients can also stem from anemia, sleep disturbances, inadequate nutrition, or comorbid psychological conditions such as depression.

## 5 Conclusions

The conclusion that can be drawn from this study is that dry cupping therapy administered twice a week for five weeks, with each session lasting 10-15 minutes, can reduce fatigue levels in CKD patients undergoing hemodialysis. However, this study has several limitations. First, the sample size was modest (n=30). Secondly, randomization was lacking. Thirdly, there was a possibility of selection bias. Furthermore, there was an absence of long-term follow-up, and relevant biochemical markers, such as hemoglobin and albumin, were excluded.

Dry cupping can be integrated into modern healthcare services and become a complementary therapy for patients undergoing hemodialysis in hospitals. Nevertheless, the formal integration process will take time because the formal regulations need to be prepared. In future studies, larger randomized controlled trials with longer follow-up should be included to assess the sustained effects of dry cupping on fatigue. Investigating biochemical and psychosocial correlates, along with integrating multimodal therapies, may support a more comprehensive fatigue management approach in CKD.

## Declaration of Interest

The authors declare no conflict of interest

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## Data Availability

The data for this study are not available to the public, as they contain confidential information from the participants.

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