



The Effect of Foot Massage with Oil Aromatherapy on Hemodialysis Patients' Sleep Quality

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ARTICLE INFO

Article history:

Received 10 October 2022
Accepted 31 January 2023
Published 20 March 2023

Keyword:

Hemodialysis
Foot massage
Aromatherapy oil

ABSTRACT

Hemodialysis is a process of cleaning the blood outside the body that involves taking blood from a blood vessel with a dialyzer. Patients undergoing hemodialysis often experience a decrease in the quality of their sleep. Sleep quality can be improved by taking non-pharmacological measures, namely foot massage. Foot massage can be felt better with aromatherapy oil. This study aims to identify the effect of foot massage with aromatherapy oil on sleep quality in patients undergoing hemodialysis. This study is a quasi-experimental design with an equivalent control group. The sample is 64 selected using consecutive sampling. Data was collected using The Pittsburgh Sleep Quality Index. Data were analyzed by pair t-test and independent t-test. The results showed that there were differences in sleep quality in the intervention group after the action ($t=4.34$, $p=0.000$) and in the control group ($t=3.31$, $p=0.002$). The results also showed that there was a difference in sleep quality between the treatment group and the control group of patients undergoing hemodialysis ($t=2.096$, $p=0.04$). The conclusion is that there is an effect of foot massage with aromatherapy oil on sleep quality in patients undergoing hemodialysis. Suggestions for a foot massage with aromatherapy can be one of the non-pharmacological measures to help improve sleep quality in patients undergoing hemodialysis.

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Kata kunci:

Hemodialisa
Pijat Kaki
Minyak Aromaterapi

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DOI: 10.30604/jika.v8i1.1398

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ABSTRAK

Hemodialisis adalah proses pembersihan darah di luar tubuh yang melibatkan pengambilan darah dari pembuluh darah dengan dialyzer. Pasien yang menjalani hemodialisa sering mengalami penurunan pada kualitas tidurnya. Kualitas tidur dapat mengalami peningkatan dengan dilakukan tindakan non farmakologi yaitu foot massage. Foot massage dapat lebih dirasakan dengan adanya aromatherapy oil. Penelitian bertujuan untuk mengidentifikasi pengaruh foot massage dengan aromatherapy oil terhadap kualitas tidur pada pasien yang menjalani hemodialisa. Penelitian ini adalah kuasi eksperimen dengan desain equivalent control group. Sample adalah 64 dipilih dengan menggunakan consecutive sampling. Data dikumpulkan dengan The Pittsburgh SleepQuality Index. Data dianalisis dengan pair t-test dan independent t-test. Hasil didapatkan ada perbedaan kualitas tidur pada kelompok intervensi setelah dilakukan tindakan ($t=4,34$, $p=0,000$) dan pada kelompok kontrol ($t=3,31$, $p=0,002$). Hasil juga menunjukkan bahwa ada perbedaan kualitas tidur antara kelompok tindakan dan kelompok kontrol pasien yang menjalani hemodialisa ($t= 2,096$, $p=0,04$). Kesimpulan ada pengaruh foot massage dengan aromatherapy oil terhadap kualitas tidur pada pasien yang menjalani hemodialisa. Saran tindakan foot massage dengan aromatherapy dapat menjadi salah satu tindakan non-farmakologi untuk membantu meningkatkan kualitas tidur pada pasien yang menjalani hemodialisa.

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INTRODUCTION

Hemodialysis is a process of cleaning blood outside the body that involves taking blood from a blood vessel with a dialyzer. Hemodialysis helps the patient to increase life expectancy but cannot help solve all the patient's physical and mental problems. Kidney failure patients undergoing hemodialysis suffer from several problems such as sleep disorders with a prevalence of 20% to 80% (Malekshahi, Aryamanesh, & Fallahi, 2018).

The results of Unal and Akpinar's (2016) research that hemodialysis patients experience fatigue due to fluid electrolyte imbalance, abnormal energy expenditure, and depression which cause patients to experience sleep disorders. Hasbi and Sutanta (2020) showed that among patients with chronic kidney failure who had undergone hemodialysis therapy for more than 3 months, 100% experienced poor sleep quality. This is in line with Ningrum, Imardiani, and Rahma (2017) who state that 52% of patients undergoing hemodialysis who are more than 55 years old have poor sleep quality.

Foot massage therapy can be given as a solution. Foot massage is a complementary therapy which is an effective non-pharmacological therapy to overcome the disturbances felt by hemodialysis patients. Foot massage or foot massage can provide a deeply relaxing effect, reduce anxiety, reduce pain, and physical discomfort, and improve sleep quality (Afianti & Mardhiyah, 2017). Arslan, Ceyhan, and Mollaoğlu (2021) showed that foot massage can positively impact sleep in hypertensive patients. This is influenced by foot massage can provide comfort such as a sense of relaxation, reduce pain, improve sleep quality, and stabilize blood pressure.

Foot massage can be supported by aromatherapy oil, namely lavender oil. Mohammadpourhodki et al. (2021) said that lavender oil aromatherapy can improve the quality of life of hemodialysis patients. This is because lavender oil used for massage is gradually absorbed through the skin (between 10-30 minutes) and causes its herbal therapeutic effects such as sedation, anti-anxiety, analgesic, and positive effects of massage therapy such as vasodilation, increasing skin temperature, relaxing the body, reduce pain, anxiety, and depression. The results of this study are in line with Hashemi, Hajbagheri, and Aghajani (2015) who found that foot massage using lavender oil was effective in reducing the severity of restless leg syndrome.

The results of interviews with 10 hemodialysis patients at Imelda Indonesian Workers Hospital Medan stated that they found it difficult to sleep, often woke up at night, when they woke up the body did not feel refreshed, restless feeling, had pain in the muscles of the body and had never known that massage on the feet can provide comfort. Based on this background, this researcher examined the effect of foot massage with aromatherapy oil on the sleep quality of patients undergoing hemodialysis at Imelda Indonesian Workers Hospital in Medan. The purpose of this study was to examine differences in sleep quality before and after in the intervention group and control group and to examine differences in sleep quality after the action in the intervention group and control group.

METHOD

Participant characteristics and research design

The inclusion criteria in this study were a) patients who underwent hemodialysis regularly; b) adult patients with an

age range of 18-65 years; c) patients who had undergone hemodialysis for more than 3 months; d) who did not experience sensitivity to lavender oil; e) respondents wanted to participate in the study; f) respondents were fully aware and able to answer questions, and g) can communicate well. This study was a quasi-experimental design with an equivalent control group design.

Sampling procedures and Sample size

The samples used were 64 respondents who underwent hemodialysis which were divided into two groups, 32 intervention groups, and 32 control groups. The sampling technique is consecutive sampling.

Intervention

Foot massage was performed 1 hour after hemodialysis within 20 minutes 3 times a week for 3 weeks. The intervention group performed foot massage using aromatherapy oil, namely lavender oil, and the control group performed foot massage without using aromatherapy oil.

Measures

Research data collection using the instrument The Pittsburgh Sleep Quality Index (PSQI). The sleep quality of patients undergoing hemodialysis was measured before a foot massage and after a foot massage.

Data analysis

Data were analyzed by pair t-test to examine differences in sleep quality in the intervention group before and after the action and the control group. The study was also analyzed by independent t-test to examine differences in sleep quality between the intervention group and the control group of patients undergoing hemodialysis.

RESULTS AND DISCUSSION

The characteristics of hemodialysis respondents based on age showed that the majority of the respondents (81.3%) in the intervention group were late elderly with an average age of 60.22 years (SD = 3.53) while for the control group the majority of respondents (81.3 %) were late adults with an average age of 57.93 years (SD=2.99). Based on gender showed that the majority of the respondents were male (intervention = 78.1%, control = 65.6%). Based on marital status showed that the majority of the intervention group was married (65.6%), less than a quarter were widowed (21.9%), and widowed (12.5%). The majority control group is married (68.8%), and less than a quarter of the respondents (15.6%) are widowed. Based on their last education showed that more than a quarter of the respondents in the intervention group had a primary school (28.1%), less than a quarter of the total respondents were 21.9% high school, 18.8% junior high school and Diploma 3, and 12.5% have a bachelor. In the control group, less than half of the respondents have a junior high school (37.5%), more than a quarter have an elementary school (28.1%), less than a quarter have a high school (18.8%), D3 (9.4%), no school and bachelor (3.1%).

Table 1
Frequency Distribution of Respondent's Characteristics of Patients Undergoing Hemodialysis

Data	Intervention group		Control group	
	n	%	n	%
Age (year)				
Early elderly	3	9,4	6	18,8
Late elderly	26	81,3	26	81,3
Very old	3	9,4	0	0
Mean ± SD	60,22 ± 3,53		57,93 ± 2,99	
Min - Max	53 - 66		50 - 63	
Gander				
Male	25	78,1	21	65,6
Female	7	21,9	11	34,4
Status				
Married	21	65,6	22	68,8
Widower	7	21,9	5	15,6
Widow	4	12,5	5	15,6
Educational				
No school	0	0	1	3,1
Primary school	9	28,1	9	28,1
Junior high school	6	18,8	12	37,5
Senior high school	7	21,9	6	18,8
Diploma 3	6	18,8	3	9,4
Bachelor	4	12,5	1	3,1

Table 2
Frequency Distribution of Sleep Quality of Patients Undergoing Hemodialysis at Imelda Indonesian Workers Hospital in Medan

Sleep Quality	Intervention group				Control group			
	Before		After		Before		After	
	N	%	n	%	n	%	n	%
Good	8	25	6	18,8	3	9,4	3	9,4
Mild	1	3,1	8	25,5	2	6,3	6	18,8
Moderate	11	34,4	15	46,9	14	43,8	18	56,3
Bad	12	37,5	3	9,4	13	40,6	5	15,6
Mean ± SD	16 ± 7,54		13,66 ± 6,03		18,19 ± 5,92		15,66 ± 5,58	
Min - Max	2 - 26		3 - 24		3 - 26		3 - 26	

The results showed that the quality of sleep in the intervention group before the action was found that more than a quarter of the respondents (37.5%) had good sleep quality and after treatment, less than half of the respondents (46.9%) had moderate sleep quality. In the

control group before the action less than half of the respondents (43.8) had moderate sleep quality and after the action more than half of the respondents (56.3%) had moderate sleep quality.

Table 3
Differences in sleep quality before and after the procedure of patients undergoing hemodialysis at Imelda Indonesian Workers Hospital in Medan

Variable	Intervention group (n=47)		Control group (n=47)	
	Mean Difference	t (sig)	Mean Difference	t (sig)
Sleep Quality	31	4,34 (0,000)	31	3,31 (0,002)

This study used bivariate analysis, namely a statistical paired t-test to identify sleep quality before and after the action in both groups. The results of this study indicate that there is a difference in sleep quality before and after the intervention in the intervention group (t=4.34, p=0.000) and the control group also found differences in sleep quality (t=3.31, p=0.002) before and after action.

Table 4
Differences in Sleep Quality in the Intervention Group and Control Group of Patients Undergoing Hemodialysis at Imelda Indonesian Workers Hospital Medan

Variable	Mean Difference	t	Sig
Sleep Quality	62	2,096	0,04

This study used bivariate analysis, namely a statistical independent t-test to identify differences in sleep quality between the intervention group after the intervention and the control group. The results of the study found that there was a difference in sleep quality between the intervention group after the procedure and the control group of patients undergoing hemodialysis ($t = 2.096, p = 0.04$).

The results showed that the quality of sleep in the intervention group before the action was found that more than a quarter of the respondents had good sleep quality and after the action, less than half of the respondents had moderate sleep quality. In the control group before the action, less than half of the respondents had moderate sleep quality and after the action, more than half of the respondents had moderate sleep quality. The results of this study are in line with the results of research by Saraswati, Lestari, and Putri (2022) that chronic kidney failure patients undergoing hemodialysis have poor sleep quality as much as 14.9% of 47 patients. This happens because there is a relationship with stress levels ($p=0.002$). The level of stress occurs due to complications and treatment of chronic kidney failure takes a lifetime and affects the physical activity of the patient. The results of this study are also in line with the results of Safruddin, Ahmad, and Radjab (2016) that patients undergoing hemodialysis mostly experience sleep quality in the poor category. Sleep quality worsens due to comorbidities that cause anxiety and discomfort. This study is in line with the research results of Astuti, Lestari, and Simbolon (2021) that sleep quality is influenced by anxiety level ($p=0.011$).

This study shows that there is an effect of foot massage with aromatherapy oil on the quality of life in patients undergoing hemodialysis. This study acted, namely foot massage for 20 minutes in three weeks in both groups. The difference between the two groups was the intervention group for foot massage used aromatherapy oil, namely lavender oil, while the control group without use aromatherapy oil. Sleep quality in patients undergoing hemodialysis in the intervention group after foot massage treatment experienced an increase in the quality of sleep for the better. The same thing happened in the control group where the quality of sleep improved for the better. The difference between the two groups was seen in the increase in sleep quality where the intervention group with aromatherapy oil had a more significant improvement in sleep quality compared to the control group who did foot massage without aromatherapy oil.

Massaging the leg muscles will stimulate the limbic system to produce the Corticotropin-Releasing Factor. This product can stimulate the pituitary gland to secrete endocrine and pro-opioid melanocortin which can increase the productivity of encephalon by the adrenal medulla which affects a person's mood changes (Saragih, Darmajaya, & Harahap, 2019). Foot massage or foot massage can provide a deeply relaxing effect, reduce anxiety, reduce pain, and physical discomfort, and improve sleep quality (Afianti & Mardhiyah, 2017). The increase in endorphins and serotonin in the brain will create a feeling of physical relaxation (Salmi et al., 2021). In addition, endorphins will suppress cortisol secretion, so that in addition to being physically relaxed, the patient will also feel relaxed psychologically. Increasing endorphins can dilate blood vessels (Priyanto, Mayangsari, & Nurhayati, 2020). Relaxed patients can feel the comfort which can improve sleep quality in hemodialysis patients. In line with the results of Aini and Maliya (2020), foot massage can improve the quality of sleep of patients undergoing hemodialysis.

Aromatherapy is based on the theory that inhalation or absorption of essential oils through massage can make changes in the limbic system, the part of the brain associated with memory and emotion that can stimulate physiological responses of the nervous, endocrine, or immune systems, and affect heart rate, blood pressure, respiration brain wave activity and the release of various hormones throughout the body (Ahmady, Rezaei, & Khatony, 2019). According to (Mirbagher Ajorpaz, Rahemi, Aghajani, and Hashemi (2020) explaining that massaging using lavender oil can improve sleep quality, reduce pain when inserting dialysis needles, and can reduce depression in hemodialysis patients. This is also in line with the research results of Mohammadpourhodki et al. (2021) stated that lavender oil aromatherapy can improve quality of life, sleep quality, and reduce fatigue in hemodialysis patients (p -value 0.001). This is because the lavender oil used for massage is gradually absorbed through the skin (between 10-30 minutes) and causes its herbal therapeutic effects such as sedation, anti-anxiety, analgesic, and positive effects of massage therapy such as vasodilation, increasing skin temperature, relaxing the body, reduce pain, anxiety, and depression.

In addition, the results of research by Ningsih, Maliya, and Kusnanto (2020) said that there was an effect of lavender oil massage on Restless Leg Syndrome (RLS) in patients undergoing hemodialysis. The researcher explained that lavender oil massage for 2 weeks could reduce the RLS score because of an increase in muscle stretch that affects the stability of motor control and increased blood flow to the brain.

Therefore, it can be concluded that foot massage can improve the sleep quality of patients undergoing hemodialysis and is more effective when foot massage is performed using aromatherapy oil, namely lavender oil.

CONCLUSIONS AND SUGGESTION

There are differences in sleep quality in the intervention group after the action and in the control group. There were differences in sleep quality between the treatment group and the control group of patients undergoing hemodialysis. There is an effect of foot massage with aromatherapy oil on sleep quality in patients undergoing hemodialysis. Suggestions for a foot massage with aromatherapy can be one of the non-pharmacological measures to help improve sleep quality in patients undergoing hemodialysis.

ETHICAL CONSIDERATIONS

This study was approved by Research and Community Service Institutions, Universitas Imelda Medan (UIM) with number: NO.321/LPPM-UIM/IX/2022/e.

Funding Statement.

The authors did not receive support from any organization for the submitted work and no funding was received to assist with the preparation of this manuscript.

Conflict of Interest Statement

The author declares that there is no potential conflict of interest concerning the authorship and publication of this article.

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