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Effect Of Foot Reflexology Therapy On Fatigue And Sleep Quality In Children Undergoing Hemodialysis: A Systematic Review

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ABSTRACT

Background: Children with chronic kidney failure often experience fatigue and lack of sleep which has an impact on the child's quality of life, so intervention is needed to overcome these problems. Object: This study aims to determine the impact of foot reflexology therapy on fatigue and sleep quality in children with chronic kidney failure who are undergoing hemodialysis. Method: In this research, we identified findings on the research topic. The data used is secondary data taken from scientific articles in Indonesian and English from 2016 to 2022. Literature searches were carried out comprehensively through electronic databases, from Elsevier, Pubmed (NCBI), ResearchGate, Cochrane Library and Google Scholar. Results: from 4 articles, foot reflexology therapy can reduce fatigue and improve the sleep quality of children undergoing hemodialysis. Conclusion: This study shows that foot reflexology therapy can reduce fatigue and improve sleep quality in patients undergoing hemodialysis. Recommended that foot reflexology therapy be used to reduce fatigue and sleep disorders in children undergoing hemodialysis.

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1. INTRODUCTION

Chronic kidney disease (CKD) is a failure of kidney function in maintaining metabolism and fluid and electrolyte balance caused by progressive damage to the kidney structure with manifestations of accumulation of metabolic waste (toxic uremic) in the blood. (1) Kidney damage is progressive and irreversible, requiring constant renal replacement therapy, such as dialysis or a kidney transplant. Chronic kidney disease is a global public health problem with an increasing prevalence and incidence with a poor prognosis and requires further therapy or treatment.

Based on report data obtained from the United States Renal Data System (USRDS, 2016), states that the number of chronic kidney disease in the United States in 2014 was 678,383 cases. Based on the results of data from Basic Health Research (2018), it shows that the prevalence of chronic kidney disease in Indonesia has increased from 2,0% in 2013 to 3,8% in 2018. The province with the highest incidence of chronic kidney disease is the province of Kalimantan. North Maluku (6,4%) was followed by North Maluku (6,1%), while the province with the lowest incidence of chronic kidney disease was West Sulawesi (1,7%), North Sumatra (3,1%) and North Sumatra (3,1%). according to Hill et al., (2016), stated that the global prevalence of chronic kidney disease was 13,4%. (2)

Based on the Kidney Disease: Improving Global Outcomes (KDIGO) have defined CKD as an abnormality of kidney structure or function, present for more than 3 months, with health implications. This definition has been formulated for the adult population, where CKD is a common and well-known health problem, but the KDIGO guidelines for definition and staging are not fully applicable to the pediatric population. (1) Pediatric CKD presents clinical features that are specific and truly unique for a child's age, such as the impact of disease on growth. In addition, some of the typical characteristics of pediatric CKD, such as the etiology or cardiovascular complications, are variable, not only affecting the child's health.

Therefore, we should be aware that the increased survival of pediatric patients with CKD, due to improvements in clinical and therapeutic management, will cause a large number of affected adults

to face problems specific to CKD that has started during childhood. In this review, we will focus not only on the unique issues concerning pediatric CKD, but especially on the factors associated with CKD that begins in childhood and requires appropriate management to optimize patient health outcomes.

The incidence and prevalence of CKD is greater in males than females because of the higher frequency of congenital abnormalities of the kidney and urinary tract in males. Finally, race is another factor specifically affecting the epidemiology of CKD. In particular, in North American, the incidence of CKD is two to three times higher in African – American children compared with Caucasian children, irrespective of gender, whereas in Australia and New Zealand, the risk of end stage renal disease (ESRD) is greater in indigenous children than in the remainder of the pediatric population. (1) In addition, factors related to CKD that start during childhood and require treatments in order to optimize health outcomes with hemodialysis.

A person with a chronic kidney disease who already has a disorder renal function usually requires renal replacement therapy or hemodialysis. Hemodialysis is a long-term therapy that is usually done in patients with heart chronic kidney disease. Hemodialysis acts as a filter to remove existing toxins in blood. However, hemodialysis therapy cannot cure the disorder kidney in patients. Therefore, complications often occur, namely hypotension, pain, chest, dialysis balance disorders, muscle cramps, nausea and vomiting and sleep disturbances. (3)

Hemodialysis is still the most popular renal replacement therapy in most countries in the world. There are more than two million patients currently undergoing hemodialysis worldwide. Hemodialysis is mostly done in the United States which reaches about 350,000 patients, in Japan 300,000 patients, while in Indonesia it approaches 15,000 patients. Hemodialysis is a process of regulating the blood of substances whose concentration is excessive in the body, this process is carried out using a device that works as an artificial kidney (dialyzer). Hemodialysis has various impacts, many of the effects of hemodialysis therapy, one of the effects that often occurs is fatigue. (4)

Fatigue experienced by hemodialysis patients can occur due to reduced production of erythropoietin, fragile blood capillaries that can cause blood loss, decreased platelet function, and increased cytokine inhibitors. Fatigue can also be caused by anemic conditions that occur in patients with chronic kidney failure. Anemia is caused by a failure to produce erythropine which is caused by the loss of non-excretory function of the kidneys, resulting in a state of fatigue. Therefore, fatigue is a problem that requires early observation and treatment because it has a negative impact on the quality of life and can threat the patient's life. In addition, fatigue can affect the sleep quality of children undergoing hemodialysis in Cipto Mangunkusumo Hospital Jakarta.

Interventions to reduce fatigue can be done with pharmacologic or non-pharmacological therapy. Non-pharmacological therapies are provided such as nutritional therapy, yoga, acupressure, and foot reflexology therapy. Massage therapy involves palpation of soft tissues and muscles, massage is a therapeutic touch that's lead to physical and mental relaxation and is capable of producing energy transmission between practitioner and subject and therefore can be used to help patients overcome fatigue. (3)

Foot reflexology therapy is widely used because there are no side effects in its application and it is considered safe to do and there are no long-term effects. Reflexology is the oldest treatment in the world, based on scientific massage techniques and has been developed since ancients China and Egypt. Foot reflexology is a massage done in the foot area. Reflexology is the study of massage at certain points on the body that can be done by hand or objects such as wood or rubber. Reflexology treatment is based on the principle that in the areas of the feet, hands, and ears that are connected to other parts of the body or organs through the nervous system, pressure or massage in the area will trigger the movement of energy in the along the neural tract which will help restore homeostasis balance body energy. The massage mechanism starts from massage on the feet that end on the soles of the feet, starting with giving a gentle rub repeatedly increases the temperature increase in the rubbing area that activates the sensor nerves in the legs resulting in vasodilation of blood and lymph vessels which affects blood flow to increase, blood circulation becomes smooth. Foot massage activates parasympathetic activity and then gives a signal neurotransmitter to the brain, internal organs, and

bioelectricity throughout the body. Signal sent to the brain will flow alpha waves in the brain. (5),(6),(14)

2. METHODS

Method Used

The method used in the literature is a narrative review using the preferred reporting items for systematic review (PRISMA) flow diagram. In this study, we identified the findings on the research topic. The data use are secondary data takes from scientific articles in Indonesian and English from 2016 to 2022 with database a used to search for articles on the hand and foot reflexology therapy on reducing fatigue and improvement sleep quality in children undergoing hemodialysis.

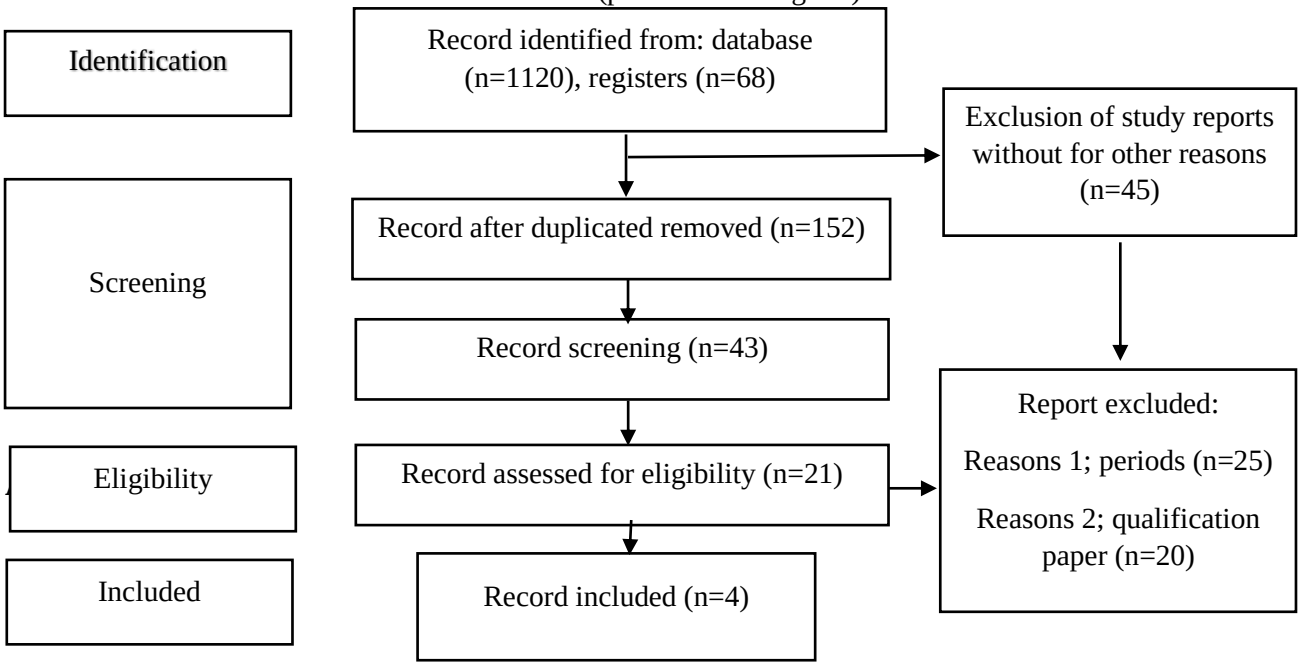
The strategy of literatures search

The literature search was carried out comprehensively through electronic databases, from Elsevier, Pubmed (NCBI), ResearchGate, Cochrane Library and Google Scholar. Search literature based on qualitative study design criteria, national and international articles, published in the past 7 years (2016 to 2022), and in English and Indonesian. We used the keywords of the hand and foot reflexology therapy on reducing fatigue and improvement sleep quality in children undergoing hemodialysis. The strategy literature search with in prisma flow diagram included.

3. RESULTS AN DISCOSION

The results this literature study uses three quantitative articles which have been summarized in tabular form (Table 1). Of the three articles, two studies used a quasi-experimental design, one randomized controlled trial, and one study with a single blind clinical trial design. This study involved a total of 227 respondents who were undergoing hemodialysis.

Table 1. Discussion (prisma flow diagram)



Tittle	Objective	Sample	Methods	Impact
Effect of foot reflexology versus cryotherapy on pain associated with arterial puncture among	The aims for effect of foot reflexology versus cryotherapy on pain,	A convenience sampling of 90 critically ill children who admitted to the previously mentioned settings and fulfilled the	Quasi experimental research design was used.	The impact for effect of foot reflexology versus cryotherapy.

Tittle	Objective	Sample	Methods	Impact
critically ill children. Badr, et.al., (2020).		following criteria comprised the study subjects: Age ranged from 3-6 years.		
Effect of foot reflexology on hemodialysis school age children on fatigue and sleep quality. Mohamed, et.al., (2021).	Evaluate the effect of foot reflexology on hemodialysis school age children on fatigue and sleep quality.	Purposive sample of children on school age on maintenance hemodialysis (n=30), those who received regular hemodialysis more than two times a week within at least three months, had no communication problems and had no other medical conditions, such as juvenile diabetes, cancer.	To meet the study's objective, quasi-experimental research design was used.	Continuous evaluation of the presence or development of fatigue or sleep problems in patients with hemodialysis. Researchers are also required to compare reflexology with other alternative/complementary therapies (e.g. massage, healing touch, response to relaxation).
The effects of foot massage on hemodialysis patients' sleep quality and restless leg syndrome: a comparison of lavender and sweet orange essential oil topical application. Oshvandi, et.al., (2021).	Hemodialysis (HD) patients suffer more sleep problems (poor sleep quality and restless leg syndrome [RLS]). Complementary therapy, especially massage with aromatherapy oil is one of the non-pharmacological treatment options with less adverse effects than routine methods. The purpose of this study was to determine the effects of foot massage with of lavender and orange essential oil on HD patients' sleep quality and RLS.	Patients divided into three groups with random allocation (35 participants per groups in lavender, orange, and control group).	This is a double blind randomized controlled trial on 105 HD patients was conducted at a large educational hospital in Iran, Hamadan province between January and September 2017. Foot massage during HD with lavender and orange essential oil was administered to the patients three times a week for three weeks, and every massage lasted half an hour. The control group received routine care. Before the intervention, the end of the first, second, and third weeks Pittsburgh Sleep Quality Index (PSQI) and RLS questionnaire	Aromatherapy prepared with lavender oil and sweet orange may be recommended to increase sleep quality and RLS level of the hemodialysis patients.

Tittle	Objective	Sample	Methods	Impact
			were completed for all three.	
The effectiveness of foot reflexology in the severity of restless legs syndrome in female patients undergoing dialysis: a randomized controlled trial. Ghasemi, et.al., (2018).	Restless leg syndrome is an ordinary complaint among patients undergoing hemodialysis. Reflexology is a nursing intervention that can reduce the restless leg syndrome. This study aimed at investigating the effect of foot reflexology on the severity of restless leg syndrome in patients undergoing hemodialysis.	Using a random sampling method, 72 female patients were divided into the experimental and placebo groups (n = 36 in each group).	A randomized controlled trial with a before-and-after design was conducted in hemodialysis patients attending a hospital in an urban area of Iran in 2016. The patients in the experimental group received foot reflexology.	Foot reflexology can be used as a safe and non-pharmacologic nursing intervention in reducing the restless leg syndrome among female patients undergoing hemodialysis.

4. CONCLUSION

This study has foot reflexology therapy reduce fatigue and improvement sleep quality for patients undergoing hemodialysis, it suggested that foot reflexology therapy be used to reduce fatigue and sleep problems by children undergoing hemodialysis patients. Foot reflexology therapy is a simple and easily applied intervention for children.

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