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Effect of Warm Water Footbath Therapy on Fatigue Among Patients Undergoing Hemodialysis

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ABSTRACT

Chronic renal failure is a complex crippling condition influencing more than 70 million individuals around the world. Chronic Kidney disease has been recognized as a leading public health problem worldwide. Hemodialysis is essential to prolong the life in patients with Stage 5 renal failure. Fatigue is the most common complication which is being faced by patients with end stage renal disease undergoing hemodialysis. There are many uses of complementary therapies like hydrotherapy to reduce fatigue and it is becoming a significant part of modern day health care with millions taking treatment each year. The present study was intended to assess the effect of warm water foot bath therapy on fatigue among patients undergoing hemodialysis. The main objectives of the study were to assess the level of fatigue among patients undergoing hemodialysis, evaluate the effect of warm water foot bath therapy on level of fatigue among patients undergoing hemodialysis, find out the association between level of fatigue and selected socio demographic variables among patients undergoing hemodialysis, find out the association between level of fatigue and clinical variables among patients undergoing hemodialysis. A quasi-experimental pre-test post-test control group design was adopted. Samples were selected using purposive sampling and they consisted of 60 patients undergoing hemodialysis, 30 in experimental and 30 in control group from dialysis department of Ananthapuri hospitals and research institute, Thiruvananthapuram. A structured interview schedule was used to assess socio-demographic and clinical variables, Piper Fatigue Scale was used to assess the fatigue among patients undergoing hemoialyis. A pre-test was given to both experimental and control group using Piper Fatigue Scale. Followed by pre-test warm water foot bath therapy was given to experimental group for 3 consecutive dialysis. Post-test was done on 3rd day of intervention for both the groups using same tool. Data was analysed using descriptive and inferential statistics. Results revealed that there was a statistically significant difference ($p<0.05$) in the post-test score of fatigue between experimental and control group. There was a significant association between level of fatigue and physical activity, blood pressure, duration of renal failure ($p<0.05$). The study concluded that warm water foot bath therapy was effective in reducing fatigue among patients undergoing hemodialysis.

Keywords: Fatigue, Warm water foot bath therapy, Patients undergoing hemodialysis, Piper Fatigue Scale.

INTRODUCTION

Chronic Kidney disease is a rapidly growing health problem. The National Kidney Foundation defines Chronic Kidney Disease as kidney damage with Glomerular Filtration Rate (GFR) <60 ml/minute/1.73m2 for 3 months. Recognition of the type of Kidney disease and etiology may be useful to prevent or slow progression of the disease.[1] Chronic kidney disease (CKD) involves progressive loss in kidney function over a period of months or years. Each of your kidneys has about a million tiny filters, called nephrons. If nephrons are damaged, they stop working. For a while, healthy nephrons can take on the extra work. But if the damage continues, more and more nephrons shut down. After a certain point, the nephrons that are left cannot filter your blood well enough to keep you healthy. When kidney function falls below a certain point, it is called kidney failure. Kidney failure affects your whole body and can make you feel very ill. Untreated kidney failure can be life-threatening. About 1 in 10 people have some degree of CKD. It can develop at any age and various conditions can lead to CKD. It however becomes more common with increasing age. After the age of 40, kidney filtration begins to fall by approximately 1% per year. On top of the natural aging of the kidneys, many conditions which damage the kidneys are more common in older people including diabetes, high blood pressure and heart disease. It is estimated that about one in five men and one in four women between the ages of 65 and 74 and half of people aged 75 or more have CKD. In short, the older you get the more likely you are to have some degree of kidney disease. This is important because CKD increases the risk of heart attack and stroke, and in some cases can progress to kidney failure requiring dialysis or transplantation. Regardless of your age, simple treatments can slow the progression of kidney disease, prevent complications and improve quality of life. According to the United States Renal Data System, in 2015, there were 124,411 new ESRD diagnoses, reflecting an increasing burden of kidney failure. The prevalence of the disease has been rising at a stable number of about 20,000 cases per year.[2] The Million Death Study estimated the number of kidney failure deaths to be 136,000 in 2015. A 2018 estimate put the number of patients on chronic dialysis in India is about 175,000, giving a prevalence of 129 per million population (13–15.04% with stage 1, 2 and 3 as 6.62%, 5.40% and 3.02% respectively).[3] As per the statistics of the government agency 'Mrithasanjeevani', there are about 2.5 lakh kidney patients in Kerala. But official estimates say that 23,500 patients are undergoing maintenance haemodialysis at present in Kerala, which means that about 635 per million population in the State are on dialysis. Chronic kidney disease (CKD) is common and harmful: 1 out of 10 adult people worldwide have it, and if left untreated it can be deadly. While early detection allows for disease care and management to help prevent morbidity and mortality, and improve cost effectiveness and sustainability, kidney disease related mortality continues to increase yearly and is projected to be the 5th leading cause of death by 2040. A persistent and ongoing CKD knowledge gap exists, one that is demonstrable at all levels of healthcare. The World Kidney Day Joint Steering Committee has declared 2022 to be the year of “Kidney Health for All”. Specifically, it calls on all of us to work to bridge the knowledge gaps to better kidney care. The 2022 campaign will focus on efforts to increase education and awareness about kidney health and on reducing the stubbornly high CKD knowledge gap at all levels of kidney care.[4]

Statement of the problem

A study to assess the effect of warm water foot bath therapy on fatigue among patients undergoing hemo-

dialysis admitted in a tertiary care hospital, Thiruvananthapuram Corporation.

Objectives of the study

1. Assess the level of fatigue among patients undergoing hemodialysis
2. Evaluate the effect of warm water foot bath therapy on level of fatigue among patients undergoing hemodialysis
3. Find out the association between level of fatigue and selected socio demographic variables among patients undergoing hemodialysis
4. Find out the association between level of fatigue and clinical variables among patients undergoing hemodialysis

Operational definitions

Effect: Effect is something that inevitably follows an antecedant such as cause or agent.

[Merriam Webster]

In this study effect refers to change in level of fatigue after giving warm water foot bath therapy among patients undergoing hemodialysis.

Warm water foot bath therapy: Warm water foot bath therapy is the immersion of both feet and ankles into warm water at 40 degree Celsius.[5]

In the present study warm water foot bath therapy is the immersion of both feet and ankles into warm water at 40 degree Celsius for 15 minutes soon after dialysis for 3 consecutive dialysis (3 days).

Fatigue: Fatigue is feeling of extremely tired, usually because of hard work.

(Oxford Dictionary)

In this study fatigue refers to tiredness experienced by patients after hemodialysis as measured by Piper Fatigue Scale.

Hemodialysis: Hemodialysis is a process of removing solutes and water from the blood across a semipermeable membrane (dialyser).[6]

Patients: In this study patients refers to clients with End Stage Kidney Disease undergoing hemodialysis.

Hypothesis

H1: There is significant difference in the level of fatigue between experimental and control group after the intervention among patients undergoing hemodialysis.

Conceptual framework

The conceptual framework of the present study is based on Sr Callista Roy's Adaptation Model. According to this model a person is a bio-psychosocial being ,who cope with the environmental changes through process of adaptation. When he is not adapting positively it is manifested as ineffective response. The individual functions as a whole with interdependence of various subsystems. The adaptive system consists of input, process, effectors and output. The goal of nursing is to help people to adapt to changes in physiological needs, self-concepts, role function and interdependence relation during health and illness. According to Roy's Adaptation Model, the interaction between input, control, process, effectors, output and feedback determines the behaviour of the individual.

Input: Inputs are stimuli from the external environment and the internal self. A person's adaptation level is "a constantly challenging point made up of focal, contextual, residual stimuli, which represents the person's own standards of range of stimuli to which one can respond with ordinary adaptive responses".

The stimuli are as follows:

a. Focal stimuli are those stimuli which immediately confront the persons to participate the behaviour. In this study focal stimuli are physiological due to hemodialysis. Physical changes include fatigue, sleeplessness, muscle weakness, stress.
b. Contextual stimuli are the other stimuli which contribute to the effect of focal stimuli. The contextual stimuli include age, gender, duration of hemodialysis.
c. Residual stimuli refers to internal or external factors that may affect the behaviour. In this study residual stimuli refers to attitudes, values and beliefs of the client. Roy views regulator and cognator as the method of coping, which are considered to be the control subsystem of the person as an adaptive system.

Control process: All the input is channelled through the process of regulator and cognator mechanism which act as a control process for adaptation during warm water foot bath therapy. These control process are both biological and physiological by means of cognator and regulator responses.

- Regulator is a subsystem coping mechanism which respond automatically through neural, chemical – endocrine process. In this study it refers to changes that occur due to treatment process. This include capillary vessels dilation and become flaccid, thereby increases blood circulation, relaxes muscle, relieves congestion in internal organs and brain which stimulate nerve endings of the sole thereby it exhibit deep sense of relaxation.
- Cognator is a subsystem of coping mechanism which respond through complex process of perception and information processing, learning, judgement and emotion. The patients on hemodialysis uses coping strategies such as active cognitive coping, self motivation and perception of complications associated with hemodialysis.

Effector: These are adaptive modes. These are the ways of coping that manifest regulator and cognator activity. Roy's Adaptation Model suggest four adaptive modes. They are physiological, self-concept, role function and interdependence mode. These effectors are in the form of ineffective responses and adaptive responses.

- Physiologic mode involves the body's basic needs and ways of dealing with adaptation. In this study physiologic mode represents relief of fatigue following warm water foot bath therapy. Warm water foot bath enhances vessel dilation, relaxation of muscle, relief of congestion in internal organs thus it stimulates nerve endings of sole and provides relaxation.
- Self-conceptual mode is the composites of beliefs and feelings that one hold about oneself at a given time and is usually concerned with physical, personal, moral and ethical self. In this study it refers to patient's beliefs and feelings about themselves at a given point of time. It includes self awareness and self motivation to practice warm water foot bath to reduce fatigue.
- Role performance mode is the performance of duties based on given position in the society, which includes the way one performs a role depending on one's interaction with the other in a given situation. In this study it refers to inability to perform functions due to hemodialysis for long duration of time. Warm water foot bath help to improve circulation and enhances deep sense of relaxation thereby reducing fatigue. It enhances attitude, social integrity, increase group performance, increase independency and social activity.
- Interdependence mode involves one's relation with significant others and the support system. In this study hemodialysis patients depend on the family members, team members and social support system during treatment period. If the Chronic renal failure patients are not able to adjust to the people around

them, they may face interpersonal distress as well as problems in relationships. Warm water foot bath help to reduce fatigue thereby enhancing human values and maintain good interpersonal relationships.

Output: Output of the person is the behaviour of the person. It could be adaptive or ineffective response. Adaptive responses include treatment adherence, reduction in fatigue, decreased symptoms and improvement in coping. Ineffective responses includes non-adherence with the therapeutic regimen, problems with family and persistence of distress.[7]

METHODOLOGY

Research approach: Quantitative approach

Research design: The research design adopted for the present study was Pre test Post test control group design

Variables

- **Dependant variable**: Fatigue among patients undergoing hemodialysis
- **Independent variable**: Warm water foot bath therapy
- **Demographic variables**: Age, Gender, Marital status, Religion, Residential area, Education, Occupation, Monthly income, Physical activity, Dietary pattern and Adverse health habits.

Setting of the study

The study was conducted in the Dialysis unit of Ananthapuri Hospitals and Research Institute Chackai, Thiruvananthapuram.

Population

The study population comprised of all patients undergoing hemodialysis in Thiruvananthapuram Corporation.

Sample

Sample consisted of 60 patients above 20 years of age undergoing hemodialysis for End Stage Renal Disease in Ananthapuri Hospitals and Research Institute, Chackai.

Sample size

Sample size is calculated by using the formula

$$N=\frac{2(Z\alpha+ Z\beta)^2\sigma^2}{\Delta^2}$$

Sample size was upsized to 60 (30 in experimental and 30 in control group)

Experimental group:30

Control group: 30

Sampling technique: Sampling technique selected for this study was purposive sampling in which samples were selected based on the arrival of subjects into the dialysis unit within the prescribed time limit.

Inclusion criteria

1. Patient who are willing to participate in the study

Exclusion criteria

1. Patients who have cognitive impairment
2. Patients who are not able to comprehend Malayalam
3. Patients who are not able to sit
4. Critically ill patients

Tool and technique

Tools used for data collection in the present study were

Tool 1: Structured Interview Schedule to assess the Socio demographic and Clinical variables of the patient undergoing hemodialysis. It consists of two sections

- Section A- Socio demographic variables
- Section B- Clinical variables

Tool 2: Piper Fatigue Scale to assess the fatigue

Score	Level of fatigue
1-3	Mild fatigue
4-6	Moderate fatigue
7-10	Severe fatigue

Technique: The data was collected from the study participants using Structured Interview method

DATA ANALYSIS

Data collected were analysed using descriptive and inferential statistics. Socio-demographic data was analysed using descriptive statistics like frequency distribution, mean , median and standard deviation. Effectiveness of warm water foot bath therapy analysed by Mann-Whitney U Test.Association of socio demographic variable and level of fatigue was computed using chi square test and fisher's exact test.

RESULT

Assessment of pre-test and post-test level of fatigue among patients undergoing hemodialysis

Before the intervention, in the experimental group 50% of participants each had moderate and severe fatigue whereas in control group 3% had mild fatigue, 60% had moderate fatigue and only 37% had severe fatigue. After the intervention, in the experimental group 73% participants were having mild fatigue, 27% had moderate fatigue. In the control group 3% had mild fatigue, 67% had moderate fatigue and only 30% had severe fatigue.

Effect of warm water foot bath therapy on fatigue among patients undergoing hemodialysis

In this study, the findings shows that the pre test mean score of level of fatigue was 6.2 and 6.1 in the experimental and control group respectively shows no significant difference ($p=0.634$). The post test mean score of level of fatigue was 3.2 and 5.7 in experimental and control group respectively shows significant difference ($p=<0.01$) at 0.01 level. Hence the hypothesis H1: There is significant difference in the level of fatigue between experimental and control group after the intervention among patients undergoing hemodialysis was accepted.

Association between level of fatigue and selected socio demographic variables among patients undergoing hemodialysis

There was no significant association between level of fatigue and socio demographic variables like age, gender and adverse health habits. The association between level of fatigue and physical activity was statistically significant ($p=0.035$) at 0.05 level.

Association between level of fatigue and clinical variables among patients undergoing hemodialysis

There was no statistically significant association between level of fatigue and clinical variables such as weight, hemoglobin, creatinine, duration of diabetes, treatment for diabetes, duration of hypertension, heart disease, stage of renal failure, duration of dialysis and problems experienced during dialysis. The association between level of fatigue and blood pressure was statistically significant ($p=0.026$) at 0.05

level. The association between level of fatigue and duration of renal failure was statistically significant (p=0.043) at 0.05 level.

DISCUSSION

The present study is intended to assess the effect of warm water foot bath therapy on fatigue among patients undergoing hemodialysis. Data were collected from 60 patients (30 in experimental and 30 in control group) undergoing hemodialysis through purposive sampling. Socio- demographic and clinical variables was collected by Structured Interview. The pre test and post test level of fatigue was assessed by Piper fatigue scale. The collected data were analysed by appropriate descriptive and inferential statistics. Socio- demographic variables was analysed by using descriptive statistics like frequency distribution, mean, median and standard deviation. Effectiveness of warm water foot bath therapy analysed by Mann-Whitney U Test. Association between selected socio demographic variables, clinical variables and level of fatigue was computed using Chi square test and Fisher's exact test.

In the present study, in experimental group 43% of participants were between 61-80 years of age and in control group 70% were between 61-80 years of age. Majority of participants in the experimental and control group were males. 93% of participants were Hindus in experimental group, 63.3% were Hindus in control group. Majority of participants 77% in the experimental group were residing in urban area whereas 70% of participants in control group were residing in rural area. 43% of participants were having secondary education in experimental group whereas 37% were having secondary education in control group. Majority of participants in the experimental and control group were unskilled workers. In the experimental group 40% of participants had monthly income between Rs 5001-10000 and in control group 37% had between Rs 5001-10000. Majority of participants in both experimental and control group were doing moderate physical activity and had adverse health habits like smoking. 100% of participants in experimental and control group were on renal diet. The results are compared to a study conducted on prevalence of newly diagnosed End Stage Renal Disease among patients admitted in a tertiary care hospital Nepal revealed that the prevalence of new ESRD was found to be 11.36%, out of which 62.4% were males, and 37.6% were females. The mean age of the patient was 49.6 years. In terms of age distribution, 30% patients were of age <40 years, and 70% were of age ≥40 years.31Another study findings were observed in a study conducted in India, revealed that prevalence of ESRD over 18 years of age was 2.97% with an overall prevalence of 0.27% respectively.[8]

Considering the clinical variables in the present study, the experimental group 73.4% of participants having body weight between 40-60 Kg whereas in the control group 57% had body weight between 40-60 Kg. Majority of participants in the experimental and control group having moderate anemia. 43% of participants in the experimental group had hypertension whereas in control group 37% were hypertensives. In the experimental and control group 73.3% each were having diabetes and hypertension. In the experimental group 69% and 31% of participants had family history of diabetes mellitus and hypertension respectively. Whereas in control group 66.7% had family history of diabetes, 33.3% had family history of hypertension. Majority of participants in the experimental and control group were having renal disease for a duration of 2-5 years, of which 53.3% each had stage 4 renal failure. 60% in the experimental group had dialysis for a duration of 2-5 years whereas 66.6% in the control group had dialysis for 2-5 years respectively. Most of the participants 60% in the experimental and 46.6% in the control group had complications of fatigue and muscle cramps during dialysis. Similar study findings were observed in a cross sectional study conducted in Chennai on prevalence of Chronic Kidney revealed a high prevalence

of diabetes and hypertension 26.1% which are the major risk factors for chronic kidney disease in healthy population.[9] Another study conducted in kerala on hemodialysis practice patterns and outcomes in ESRD patients revealed that majority of them had renal disease for a duration of 5 years, out of which 79% were on twice-weekly hemodialysis and 21% were on thrice weekly hemodialysis sessions.[10]

The first objective of the study was to assess the level of fatigue among patients undergoing hemodialysis. In the present study level of fatigue was assessed by Piper Fatigue Scale and the findings revealed that in the experimental group 50% of participants had moderate fatigue and another 50% had severe fatigue whereas in control group 3% had mild fatigue, 60% had moderate fatigue and 37% were having severe fatigue respectively. This is in tune with a cross sectional study to assess the fatigue experienced by patients on maintenance dialysis in Malaysia revealed that a total of 54.4% and 45.6% respondents experienced a high level and a low level of fatigue, respectively. There was significant relationship between the duration of treatment and the level of fatigue. The respondents who had been receiving treatment for >2 years experienced more fatigue, compared to the respondents who had been undergoing hemodialysis for <2 years.[11] These results are in contrast to another study conducted in a tertiary care hospital in North India to assess fatigue, among hemodialysis patients showed that the subjects who were dialyzed twice a week had higher fatigue than those who were dialyzed thrice a week which was significant.[12]

The second objective was to evaluate the effect of warm water foot bath therapy on level of fatigue among patients undergoing hemodialysis. The present study findings shows significant reduction in the level of fatigue after warm water foot bath therapy in the experimental group compared to the control group. A quasi experimental study conducted among patients on hemodialysis in KG hospital, Coimbatore reported congruent result to findings of the present study that the warm water foot bath therapy was effective in reducing fatigue among patients undergoing hemodialysis which was statistically significant.[13] These results are in tune with another study on effectiveness of warm water foot bath on fatigue among 60 CRF patients undergoing hemodialysis in Tamil Nadu revealed statistically significant difference between the pre-test and post test level of fatigue in the interventional group.[5]

The third objective was to find out the association between level of fatigue and selected socio demographic variables among patients undergoing hemodialysis. In the present study significant association between level of fatigue and physical activity was observed. 65.1% of participants with sedentary physical activity had moderate fatigue whereas 64.1% with heavy physical activity experienced severe fatigue. This results is in contrast to a cross sectional study conducted in Iran on different aspects of fatigue experienced by patients receiving Maintenance Dialysis revealed statistically significant association between level of fatigue and gender.[14] These results are in contrast with similar quasi experimental study carried out in two dialysis units of hospitals in Athens Region on assessment of fatigue in End Stage Renal Disease patients undergoing hemodialysis revealed that patients with low educational level seem to face fatigue inadequately and experience fatigue to a greater extent, the unemployed and patients dealing with household recorded a higher overall fatigue index in relation to self-employed and civil servants, patients living in suburban areas noted lower indicator of overall fatigue and physical fatigue than those who live in the city center and there was no significant association found between level of fatigue with age and gender among hemodialysis patients.[10]

The fourth objective was to find out association between level of fatigue and clinical variables among patients undergoing hemodialysis. In the present study statistically significant association was found between level of fatigue and blood pressure. 52.4% of participants with Normal BP had severe fatigue

whereas 58.4% with hypertension experienced moderate fatigue. The association between level of fatigue and duration of renal failure was statistically significant. 54.3% of participants with renal failure <5 years experienced severe fatigue whereas 72% with renal failure >5 years experienced moderate fatigue respectively. This result is in contrast to a cross sectional study conducted to assess the fatigue experienced by 116 patients on maintenance dialysis in Malaysia revealed that a total of 54.4% and 45.6% respondents experienced a high level and a low level of fatigue, respectively. The respondents who had been receiving dialysis treatment for >2 years experienced more fatigue, compared to the respondents who had been undergoing hemodialysis for <2 years. There was significant relationship between the duration of treatment and the level of fatigue.[11]Another study conducted in a tertiary care centre in North India to assess fatigue, depression and sleep problems of patients on hemodialysis also shows contrast results to the findings of the present study. Among the parameters studied, fatigue was significantly associated with that of the frequency of dialysis, the subjects who were dialyzed twice a week had higher fatigue than those who were dialyzed thrice a week which was significant. Day time sleepiness was found to be higher in employed than in unemployed patients. Fatigue positively correlated with that of day time sleep, night time and depression. [12]

SUMMARY

The study on effect of warm water foot bath therapy on fatigue among patients undergoing hemodialysis was conducted by quasi-experimental pre-test post-test control group design using quantitative approach among 60 patients, 30 in experimental and 30 in control group and who met the inclusion criteria. The study was conducted in the dialysis department of Ananthapuri hospitals and research institute Chackai, Thiruvananthapuram by using purposive sampling. The structured interview schedule was prepared to assess socio demographic and clinical variables of patients undergoing hemodialysis, Piper Fatigue Scale to assess the level of fatigue and was validated by the experts from the field of nephrology, medical surgical nursing. The tool was verified by language experts and it was found to be equi-semantic. The reliability of tool was established by Inter rater reliability method. Reliability of Piper Fatigue Scale was 0.9. After getting permission from the Institutional Ethics Committee and administrative section of AHRI and Nephrology department a trial run of the study was conducted among 6 participants to assess the effect of warm water foot bath on fatigue among patients undergoing hemodialysis. No problem was encountered during pilot study and it was found that the study is feasible and proceeded to the main study. The conceptual framework adopted for this study was based on Sr Callista Roy's Adaptation Model. Informed consent was obtained from all participants after detailed explanation. Data was collected by structured interview schedule to assess socio demographic and clinical variables and Piper Fatigue Scale was used to assess degree of fatigue. A pre test was conducted among 60 participants (30 in experimental and 30 in control group) experiencing fatigue during hemodialysis. Warm water foot bath therapy was administered to the experimental group for 15 minutes soon after dialysis for 3 consecutive dialysis. Bath thermometer was used to assess the temperature of water (104^0F). Post test was done at the end of session for both groups using the same tool. After the data collection an awareness class was conducted to the control group regarding warm water foot bath therapy to reduce the fatigue after hemodialysis. Appropriate descriptive and inferential statistical methods were used to analyse the data. On analysis the result of the study findings revealed that warm water foot bath therapy was effective in reducing fatigue among patients undergoing hemodialysis. There was statistically significant difference in the post test level of fatigue in the experimental group compared to control group ($p<0.01$). Hence the hypothesis

"There is significant difference in level of fatigue between experimental and control group after the intervention among patients undergoing hemodialysis" was accepted.

CONCLUSION

Fatigue is the most severe complication experienced by patients undergoing hemodialysis and it is a subjective feeling that can be expressed by most of the patients. Fatigue is a profound and relentless exhaustion that pervades the entire body and encompasses weakness. The fatigue drains vitality in patients and constrains their ability to do usual activities and fulfill their roles and meet personal aspirations. Explicit recognition of the impact of fatigue and establishing additional effective interventions to improve fatigue are needed. Various pharmacological and non pharmacological measures are adopted to treat the fatigue. This study was intended to assess the effect of warm water foot bath therapy on fatigue among patients undergoing hemodialysis. Warm water foot bath therapy is the immersion of both feet and ankles into warm water at 1040F (400C) for 15 minutes soon after dialysis for 3 consecutive dialysis. By doing this capillary vessels dilate and become flaccid, thereby increases blood circulation, relaxes muscle, relieves congestion in internal organs and brain which stimulate nerve endings of the sole thereby it exhibit deep sense of relaxation. This therapy can be implemented by health care professional among patients undergoing hemodialysis to make them more comfortable and relaxed during hemodialysis session.

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