Effectiveness of Foot Reflexology on Physiological Variables and Anxiety among Hemodialysis Patients

Kishore MF,
PhD Scholar, Meenakshi Academy of Higher
Education & Research Institute (DU), Chennai.

Dr. Nalini SJ,
Principal, Sri Ramachandra Faculty of Nursing,
SRIHER, Chennai.

Dr. Valli G,
Professor & HOD, Department of Pharmacology,
Meenakshi Academy of Higher Education & Research
Institute (DU), Chennai.

Dr. Renuka K,
Principal,
Kasturba Gandhi Nursing College,
Puducherry.

Dr. Hemachandar R,
Associate Professor & HOD, Department of Nephrology,
Mahatma Gandhi Medical College & Research,
Puducherry.

Dr. Jayanthi P,
Vice Principal, Venkateshwara Nursing College,
The Tamilnadu Dr MGR Medical University,
Chennai.

Corresponding Author:
* Kingsle Kishore Coumar MF,
PhD Scholar, Meenakshi Academy of Higher Education & Research Institute (DU), Chennai.

Abstract:-
Background: The burden of chronic kidney disease is increasing in alarming proportion all over the world. Hemodialysis is a well-recognized modality of treating patients having end stage renal disease. Foot reflexology serves to relax, improve circulation and promote a general feeling of wellness among hemodialysis patients. Aim: To assess the effectiveness of foot reflexology on physiological variables and anxiety among hemodialysis patients. Material & Methods: A quasi-experimental pretest posttest control group design was used. Twelve patients underwent hemodialysis were selected from four hemodialysis centers. Foot reflexology given for 2 weeks in an alternative day. Researcher used numerical pain rating scale for pain, fatigue severity scale for fatigue, sphygmomanometer for blood pressure, doppler ultrasound for blood flow and Zung anxiety self-rating scale for anxiety to collect the data. Results: Results revealed that hemodialysis patients in experimental group had reduced level of pain (t=3.523, p= 0.007), reduced fatigue (t = 2.924, p= 0.023), systolic blood pressure (t =3.149, p=0.013) with in normal limits and reduced anxiety (t = 3.086, p= 0.015). Correlation between posttest level of anxiety and physiological variables showed that there was a significant relationship between pain and anxiety at p<0.05 level and fatigue and anxiety at p<0.05 level. Conclusion: Foot reflexology is a safe and effective tool, which helps in reducing physiological parameters and anxiety. This study highlights the need for adopting foot reflexology as an effective therapy in hospital settings.

I. INTRODUCTION

The burden of chronic kidney disease (CKD) is increasing in alarming proportion all over the world. Kidneys are probably the only vital organs which can be realistically replaced by artificial means. The survey analysis reveals CKD ranges between 0.7% to 1.4%. Whereas the incidence of end stage renal disease was estimated to be 180 to 200 per million populations.

Hemodialysis is a well-recognized modality of treating patients having end stage renal disease, moreover the side effects of hemodialysis are Low blood pressure, shortness of breath, abdominal cramps, muscle cramps, nausea, vomiting, itching, sleep problems, hypertension, fluid overload, hyperkalemia, anxiety, fatigue, etc. [1,2]

Foot Reflexology is a natural therapy that requires the application of a specific type of pressure on particular areas of the feet to help balance the body. It is based on the principle that there are reflexes in the feet which correspond to every part of the body. Reflexology serves to relax, improve circulation and promote a general feeling of wellness.[3]

The present study arose from an attempt to identify a safe and effective therapeutic intervention to promote wellbeing, which could be practicably delivered by nurses to patients undergoing hemodialysis.

II. METHODS & MATERIALS

Researcher adopted a quasi-experimental pretest posttest control group design. A formal permission was obtained from Institutional Ethical Committee of Mahatma Gandhi Medical College & Research Institute, Puducherry. Variables of the study are independent variable was foot reflexology. The dependent variable was physiological variables such as pain, fatigue, blood pressure, blood flow and anxiety of patients subjected to hemodialysis.

The pilot study was conducted at four dialysis centers in Cuddalore and Puducherry for both Experimental & control group from 11.10.2017 to 31.10.2017. The formal permission was obtained from the directors of Dialysis Centers from Cuddalore and Puducherry. Twelve patients (Experimental -6, Control -6) undergoing hemodialysis were selected for the study.

A brief introduction about the self and study were given and data was collected from the patients. Written informed consent was obtained from the patients and confidentiality of the responses was assured. After selection of samples, the investigator assessed the pretest level of pain, blood pressure, blood flow, fatigue and anxiety for patients in both the experimental and control groups using a Numerical Pain Intensity Scale, Fatigue Severity Scale, Sphygmomanometer, vascular doppler and Zung Self-Rating Anxiety Scale. Foot reflexology is administered for 6 cycles in duration of 40 minutes by the investigator for the experimental group and the control group were received no intervention. The posttest level of pain, blood pressure, blood flow, fatigue and anxiety assessed by the investigator for the experimental and control groups after two weeks of intervention.

III. RESULTS & DISCUSSION

With regard to age, in experimental group 3(50%) of them were above 60 years whereas in control group 3(50%) of them were between 50-60 years. 5(83%) male and 1(17%) female patients were included in both the group. Regarding the duration of renal failure, 3(50%) in both the groups had 1-4 years and underwent hemodialysis more than 2 years.

In the experimental group, 2(33.3%) had mild pain and 4 (66.6%) had moderate pain in pretest and 6(100 %) had mild pain in the posttest whereas in the control group 4(66.6%) had mild pain and 2 (33.3%) had moderate pain in pretest and 2 (33.3 %) had mild pain and 4(66.6%) had moderate pain in posttest. The study finding is consistent with the study conducted by Bassat, 2019 and results revealed that 55.6% of hemodialysis patients had severe pain. The study concluded that chronic pain is greatly pervasive and noticeably below treated in patients undergoing dialysis, in spite of its important adverse outcome.[4]

In the experimental group, 3(50%) had moderate fatigue and 3(50%) had severe fatigue in pretest and 2(33.3%) had no fatigue, 3(50%) had moderate fatigue and 1(16.67%) had severe fatigue in the posttest whereas in the control group 3(50%) had moderate fatigue and 3 (50%) had severe fatigue in pretest and 1(16.6%) had moderate fatigue and 5(83.3%) had severe fatigue in posttest. The study finding is consistent with the study conducted by Sharifi S, Navidian A, Jahantigh M, Shamsoddini A, 2018 and results revealed that that there was significant difference in the mean fatigue score between the control and intervention groups (P < 0.001).[5]

In the experimental group, 3(50%) had stage 1 systolic blood pressure SBP and 3(50%) had stage 2 SBP in pretest and 3(50%) had pre SBP, 3(50%) had stage 1 SBP in posttest whereas in the control group, 4(66.6%) had stage 1 SBP and 2(33.3%) had stage 2 SBP and 4(66.6%) had stage 1 SBP and 2(33.3%) had stage 2 BP in posttest. In the experimental group, 6(100%) had stage 1 DBP in pretest and 4(66.6%) had Pre DBP, 2(33.3%) had stage 1 DBP in posttest whereas in the control group, 6(100%) had stage 1 DBP in pretest and posttest. This finding is consistent with the study conducted by Agarwal, 2010 and results revealed that mortality was decreased when home and ambulatory systolic blood pressure was between 120 to 130 mm Hg and was between 110 to 120 mm Hg respectively.[6]

In the experimental group, 4(66.6%) had mild PAD and 2(33.3%) had moderate PAD in pretest and 4(66.6 %) had normal ABI and 2(33.3%) had mild PAD in posttest whereas in the control group, 1(16.6%) had normal ABI, 2(33.3%) had mild PAD,1(16.6%) had moderate PAD and 1(16.6%) had severe PAD in pretest and 1(16.6 %) had normal ABI and 2(33.3%) had mild PAD, 1(16.6%) had moderate PAD, 1(16.6%) had severe PAD, and1(16.6%) had Incompressible CA in posttest. This finding is consistent with the study conducted by Chen, 2017 and results showed that 49.6% with a normal experienced Ankle-Brachial Index a decrease at least 0.1. The study concluded that diabetes mellitus patients undergoing hemodialysis tend to progress a further rapid reduce in Ankle-Brachial Index than non-diabetes mellitus patients undergoing hemodialysis.[7]

In the experimental group, 5(83.3%) had mild anxiety and 1(16.6%) had moderate anxiety in pretest and 5(83.3%) had no anxiety and 1(16.6%) had mild anxiety in posttest whereas in the control group 4(66.6%) had mild anxiety and 2(33.3%) had moderate anxiety in the pretest and posttest. The study finding is consistent with the study conducted by Mosleh, 2020 and results revealed that 19.7% hemodialysis patients had anxiety symptoms. Anxiety symptoms were more prevalent for females than males. [8]

Hemodialysis patients in experimental group had decreased pain, decreased fatigue, blood pressure in normal range and decreased anxiety which was depicted in the Table 1 to 6. Correlation between posttest level of anxiety and physiological variables showed that there was a significant relationship between pain and anxiety at p<0.05 level and fatigue and anxiety at p<0.05 level.

Table 1: Pain among hemodialysis patients

Group	Pretest		Post Test		Mean Diff.	Paired 't' Value
	Mean	SD	Mean	SD		
Experimental	3.83	0.75	1.83	0.75	2.0	t = 7.746 p = 0.001, S***
Control	3.33	1.03	3.83	1.16	0.50	t = 1.000 p = 0.363, NS
Mean Diff.	0.50		2.0			
Unpaired 't' Value	t = 0.958 p = 0.363, NS		t = 3.523 p = 0.007, S**			

***p<0.001, **p<0.01, S – Significant, NS – Not Significant

Table 2: Fatigue among hemodialysis patients

Group	Pretest		Post Test		Mean Diff.	Paired 't' Value
	Mean	SD	Mean	SD		
Experimental	35.16	13.58	19.0	16.95	16.17	t = 3.094 p = 0.027, S*
Control	35.83	12.31	41.0	7.21	5.16	t = 2.402 p = 0.061, NS
Mean Diff.	0.67		22.0			
Unpaired 't' Value	t = 0.089 p = 0.931, NS		t = 2.924 p = 0.023, S*			

*p<0.05, S – Significant, NS – Not Significant

Table 3: Systolic blood pressure among hemodialysis patients

Group	Pretest		Post Test		Mean Diff.	Paired 't' Value
	Mean	SD	Mean	SD		
Experimental	155.0	10.48	133.33	12.11	21.66	t = 5.398 p = 0.0003, S**
Control	151.67	11.69	151./67	7.52	0.00	t = 0.000 p = 1.000, NS
Mean Diff.	33.33		18.33			
Unpaired 't' Value	t = 0.520 p = 0.615, NS		t = 3.149 p = 0.013, S*			

**p<0.01, *p<0.05, S – Significant, N.S – Not Significant

Table 4: Diastolic blood pressure among hemodialysis patients

Group	Pretest		Post Test		Mean Diff.	Paired 't' Value
	Mean	SD	Mean	SD		
Experimental	90.0	0.00	83.33	5.16	6.67	t = 3.162 p = 0.025, S*
Control	83.33	5.16	85.0	5.48	1.67	t = 0.542 p = 0.611, NS
Mean Diff.	6.67		1.67			
Unpaired 't' Value	t = 3.162 p = 0.025, S*		t = 0.542 p = 0.600, NS			

*p<0.05, S – Significant, N.S – Not Significant

Table 5: Blood flow (Ankle brachial index) among hemodialysis patients

Group	Pretest		Post Test		Mean Diff.	Paired 't' Value
	Mean	SD	Mean	SD		
Experimental	0.68	0.19	0.88	0.07	0.19	t = 3.119 p = 0.026, S*
Control	0.86	0.41	0.87	0.41	0.01	t = 1.464 p = 0.203, NS
Mean Diff.	0.18		0.006			
Unpaired 't' Value	t = 0.959 p = 0.369, NS		t = 0.039 p = 0.970, NS			

*p<0.05, S – Significant, N.S – Not Significant

Table 6: Anxiety among hemodialysis patients

Group	Pretest		Post Test		Mean Diff.	Paired 't' Value
	Mean	SD	Mean	SD		
Experimental	50.83	6.67	42.83	4.83	8.0	t = 2.915 p = 0.033, S*
Control	55.17	9.04	54.83	8.20	0.33	t = 0.598 p = 0.576, NS
Mean Diff.	4.33		12.0			
Unpaired 't' Value	t = 0.944 p = 0.369, NS		t = 3.086 p = 0.015, S*			

*p<0.05, S – Significant, N.S – Not Significant

Table 7: Correlation between posttest level of anxiety and physiological variables among hemodialysis patients.

Variables	Anxiety			
	Experimental Group		Control Group	
	'r' Value	P - value	'r' Value	P – value
Pain	0.870	0.024, S*	0.247	0.638, NS
Systolic BP	0.387	0.448, NS	0.135	0.799, NS
Diastolic BP	0.588	0.220, NS	0.111	0.834, NS
Fatigue	0.815	0.048, S*	-0.287	0.581, NS
Blood flow (Ankle brachial index)	0.754	0.084, NS	-0.061	0.909, NS

*p<0.05, S – Significant, NS – Not Significant

IV. CONCLUSION

The data collection and intervention tool used in the pilot study was found to be reliable and feasible to apply in the main study. The findings also revealed that there was a reduction in the pain, fatigue and anxiety among the experimental group after the administration of the foot reflexology. Hence, it could be beneficial to patients subjected to hemodialysis. Foot reflexology is a safe and effective tool, which helps in reducing physiological variables and anxiety. This study highlights the need for adopting foot reflexology as an effective therapy in hospital settings.

REFERENCES

[1]. Lewis et.al. Medical and Surgical Nursing and Assessment Management Of Clinical Problems, (4th ed.) Philadelphia:Mosby Publications,(1992).

[2]. C.F.Gutch (5th ed). Review of Hemodialysis For Nurses And Dialysis Personals" Missouri:Mosby Publication,(1993).

[3]. Choudhari SK, Potdar N, Hiremath P, Kharat D. A study to assess effectiveness of foot reflexology on anxiety of patients undergoing hemodialysis in tertiary care hospital, Karad, Asian Journal of pharmaceutical and clinical research, 2017,10(7):345-8.

[4]. Bassat O, Brill S, Sharon H. Chronic pain is underestimated and undertreated in dialysis patients: A retrospective case study. Hemodialysis International, 2019, 23(4):104-5.

[5]. Sharifi S, Navidian A, Jahantigh M, Shamsoddini A. Investigating the Impact of Foot Reflexology on Severity of Fatigue in Patients Undergoing Hemodialysis: A Clinical Trial Study. Medical-Surgical Nursing Journal, 2018, 7(1): e81634

[6]. Agarwal. Blood Pressure and Mortality among Hemodialysis Patients, Hypertension, 2010, 55(3):762–8.

[7]. Chen, Szu-Chia. Association of diabetes mellitus with decline in ankle-brachial index among patients on hemodialysis: A 6-year follow-up study, PloS one, 2017, 12(4): e0175363.

[8]. Mosleh H, Alenezi M, Al Johani S. Prevalence and Factors of Anxiety and Depression in Chronic Kidney Disease Patients Undergoing Hemodialysis: A Cross-sectional Single-Center Study in Saudi Arabia, Cureus, 2020, 12(1): e6668.