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Title- A study to evaluate the effectiveness of hot water foot bath on level of fatigue among patients undergoing haemodialysis in Dr. Vitthalrao Vikhe Patil Pravara Rural Hospital, Loni.

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ABSTRACT

Background of study: Currently in India, 40–60% cases are found to be having chronic kidney diseases. Fatigue is one of the highly prevalent symptoms experienced by chronic renal failure patients. Haemodialysis the treatment modality for chronic renal failure also comprises fatigue in haemodialysis patients. Non-invasive non pharmacological hydrotherapy technique of hot water footbath is effective in reducing level of fatigue among haemodialysis patients as it warms the skin, which enables dilatation of vessels

Objectives: 1. To assess the existing level of fatigue among patients undergoing haemodialysis in experimental and control group. 2. To evaluate the effectiveness of hot water foot bath on level of fatigue among patients undergoing haemodialysis in experimental group. 3. To determine the association between the post-test level of fatigue among patients undergoing haemodialysis with their selected demographic variables.

Material and methods: A quantitative evaluative approach with quasi experimental pretest post-test control group design was used to evaluate effectiveness of hot water footbath on level of fatigue among haemodialysis patients. The sample consisted of 60 patients (30 experimental group, 30 control group) undergoing haemodialysis who fulfilled eligibility criteria. Sampling technique used for the present study was non-probability purposive sampling technique. The data collection tools included socio-demographic questionnaires, modified piper fatigue scale to evaluate pretest post-test level of fatigue. Hot water footbath was provided as an intervention to the haemodialysis patients in experimental group. Descriptive and inferential statistics were used to analyse the data according to objectives.

Results: In experimental group, mean pre-test score of 7.46, Standard deviation ±0.77 and mean post test score of 4.26 with the standard deviation ±0.69. The mean difference was found out to be 3.2 with standard deviation of mean difference of ±0.4842. The 't' value obtained was 3.142 which is significant at $p<0.05$ level concludes that the hot water footbath effectively reduced level of fatigue among patients in experimental group. In experimental group, there was a significant association between post-test level of fatigue and demographic variables such as gender, education, duration of illness and cycle of haemodialysis were significant at $p<0.05$ levels and in control group there was a significant association between level of fatigue among patients undergoing haemodialysis with their gender, monthly income, duration of illness and cycle of haemodialysis.

Key words: Hot water foot bath, fatigue, patients undergoing haemodialysis.

I Introduction

The chronic kidney diseases are silent in nature and causes progressive loss of renal functions over a time declining quality of life and gradually declines quality of life. Symptoms of renal diseases include anorexia (loss of appetite), swollen ankles, swelling of extremities, shortness of breath, oliguria, proteinuria, insomnia, fatigue etc. which gradually worsens over time if not treated. [1]

Haemodialysis is a treatment modality for patients with renal diseases as it removes nitrogenous waste and extra accumulated fluid from the body with the use of artificial dialyzing machine. [2] Fatigue is one of the highly prevalent symptoms experienced by chronic renal failure patients undergoing haemodialysis with a prevalence ranging from 60 to 97%. There are various complementary therapies which can be used to reduce fatigue. They include hydrotherapy, biofeedback, aromatherapy, relaxation technique, massage, and acupuncture. [3]

A hot water foot bath warms the skin, which enables dilatation of vessels and induces heat dissipation. It is an effective method to relieve fatigue, as it increases sympathetic activity thus increasing white blood cells and natural killer cells. [4] When warm water foot bath therapy is applied at a 40◦C to 42◦C temperature to the body, the capillary vessels dilate and become flaccid and exhibit signs of loss of tension.[5]

Literature reveals that fatigue is one of the most debilitating side effects of haemodialysis among chronic renal failure patients. A hot water foot bath application is useful in relieving fatigue among haemodialysis patients so as to improve the quality of life among patients. Therefore, this study was undertaken to evaluate effectiveness of hot water footbath on level of fatigue among patients undergoing haemodialysis.

I.1 Statement of problem

A study to evaluate the effectiveness of hot water foot bath on level of fatigue among patients undergoing haemodialysis in DRVVPPRH, Loni Bk.

I.2 Objectives

1. To assess the existing level of fatigue among patients undergoing haemodialysis in experimental and control group.
2. To evaluate the effectiveness of hot water foot bath on level of fatigue among patients undergoing haemodialysis in experimental group.
3. To determine the association between the post-test level of fatigue among patients undergoing haemodialysis with their selected demographic variables.

I.3 Hypothesis

H1: There is a significant difference between the mean pre and post test score on level of fatigue among haemodialysis patients.
H2: There is a significant association between the post-test level of fatigue among haemodialysis patients with their selected demographic variables (Age, Gender, Education, Occupation, Monthly Income, Duration of Illness, Cycle of haemodialysis and Any associated Illness).

II Methodology

II.1 Research design and approach

A quantitative evaluative approach with quasi experimental pretest post-test control group design was used for the present study.

II.2 Setting of the study

The study was conducted in haemodialysis and in patient department of medicine of DRVVPPRH, Loni which is a 1275 bedded multispecialty trust hospital at Loni village.

II.3 Sample

Patients undergoing haemodialysis treatment who fulfils inclusion and exclusion criteria.

II.4 Sample size

Sample size for present study was 60 out of which 30 samples were in experimental group and 30 samples were in control group.

II.5 Sampling technique

Non-probability purposive sampling technique was used for the present study

II.6 Sampling Procedure

Samples were screened for eligibility of inclusion and exclusion criteria. Patients eligible and willing to participate were included in the study.

II.7 Inclusion and Exclusion criteria

Inclusion criteria: Patients undergoing haemodialysis who are

- Diagnosed with acute and chronic kidney diseases.
- willing to participate.
- Age between 20 years to 60 years.
- Irrespective of any gender.
- Available during time of data collection.
- Understands and speaks languages English, Marathi or Hindi.

Exclusion criteria: Patients undergoing haemodialysis who are

- Unconscious or critically ill.
- With peripheral vascular diseases and skin disorders of the feet and legs.
- With any cerebrovascular or neurological disorders.
- With any foot ulcer and Diabetes Mellitus.

II.8 Tools and techniques

Interview method was used to collect the data from the participants, which consists of following sections;

Section A: It comprised of socio-demographic variables of haemodialysis patients, including age, gender, education, occupation, monthly income, duration of illness, cycle of dialysis and history of any other associated illness.

Section B: It comprised of modified piper fatigue scale to evaluate the pretest and post-test level of fatigue among haemodialysis patients.

II. 9 Data collection procedure

Ethical aspects

a) **Ethical clearance:** Proposal was presented before Institutional Ethics Committee of PIMS(DU), Loni and ethical clearance was obtained.
b) **Permission from concerned authority:** Written permission was obtained from Medical Superintendent of the DRVVPPRH, Loni Bk.
c) **Informed written consent:** The study participants were contacted on one-on-one basis and explanation regarding study objectives, confidentiality of their data, their willingness to participate and right to withdraw from the study were provided to them. Informed written consent was obtained from participants of the study.

Data collection: After self-introduction and informed written consent the data was collected from the participants using interview method.

II.10 Data Analysis

Data was coded in the Microsoft excel sheet. Descriptive and inferential statistics were used to analyse the data according to objectives. The demographic variables were analysed by using descriptive statistics (frequency and percentage). The level of fatigue was analysed by using descriptive statics (mean, standard deviation). The effectiveness of hot water foot bath on level of fatigue was analysed by using inferential statistics (Mean differences, paired 't' test). Association between level of fatigue among haemodialysis patients and their selected demographic variables were analysed by using chi square analysis.

III Results

III.1 Assessment of socio-demographic characteristics of the study participants

The demographic findings concludes that in the experimental group, majority of the patients, 18 (61%) were more than 51 years of age, 23 (77%) were males, 10(33%) were illiterate, 13(44%) were doing private jobs, 12 (40%) had their monthly income between Rs.5000-10000/-, 20(67%) had illness for about 1-3 years, 13 (43%) with cycles of haemodialysis for more than 11 and 24 (80%) were not having any associated illness.

In the control group, majority of the patients, 19 (63%) were more than 51 years of age, 19 (63%) were females, 15(50%) were illiterate, 16(53%) were unemployed, 14 (47%) had their monthly income between Rs.5000-10000/-, 28(93%) had illness for about 1-3 years, 16(53%) were undergone less than 05 cycles of haemodialysis and 26 (87%) were not having any associated illness.

III.2 Assessment of level of fatigue among experimental and control group.

Table:2.1 - Frequency and Percentage wise distribution on level of fatigue among haemodialysis patients in experimental group

S N	Level Of Fatigue	Experimental Group							
		Pre-Test				Post Test			
		Frequency	Percentage (%)	Mean	SD	Frequency	Percentage (%)	Mean	SD
1	None	0	0	0	0	0	0	0	0
2	Mild	0	0	0	0	4	13%	3	0.5
3	Moderate	2	7%	5.66	0.57	26	87%	4.46	0.51
4	Severe	28	93%	7.66	0.48	0	0	0	0

In the pre-test of 30 haemodialysis patients which were in the experimental group, 2 (7%) of them had moderate level of fatigue with mean score of 5.66 and S.D of ± 0.57, 28(93%) had severe level of fatigue with mean score of 7.66 and S.D of ± 0.48. No one had mild or no fatigue in their pre-test assessment. Where as in the post test of experimental group, 04(13%) of them had mild level of fatigue with mean score of 03 and S.D of ± 0.5 and 26((87%) had moderate level of fatigue with mean score of 4.46 and S.D of ± 0.51 and none had severe and no fatigue in post-test assessment.

Table:2.2 - Frequency and Percentage wise distribution on level of fatigue among haemodialysis patients in control group

S N	Level Of Fatigue	Control Group							
		Pre-Test				Post Test			
		Frequency	Percentage (%)	Mean	SD	Frequency	Percentage (%)	Mean	SD
1	None	0	0	0	0	0	0	0	0
2	Mild	0	0	0	0	0	0%	0	0
3	Moderate	9	30%	5.56	0.72	4	13%	5.55	0.72
4	Severe	21	70%	7.38	0.49	26	87%	8.26	0.66

In the pre-test of 30 haemodialysis patients in the control group, 09(30%) of them had moderate level of fatigue with mean score of 5.56 and S.D of ± 0.72, and 21(70%) had severe level of fatigue with mean score of 7.38 and

S.D of ± 0.49 and no one had mild or no fatigue in their pre-test assessment. Whereas in the post-test assessment 4(13%) of them had moderate level of fatigue with mean score of 5.55 and S.D of ± 0.72 and 26(87%) had severe level of fatigue with mean score of 8.26 and S.D of ± 0.66 and no one had mild or no fatigue in their post-test assessment.

III.3 Effectiveness of hot water footbath on level of fatigue.

Table:3.1 - Mean, Standard Deviation, Mean Difference and Standard deviation of mean difference on pre-test and post-test level of fatigue among haemodialysis patients in experimental group.

S N	Experimental Group	Mean	SD	Mean Difference	Standard Deviation (MD)	'T' Test Value
1	Pre-Test	7.46	0.77	3.2	0.4842	3.142
2	Post Test	4.26	0.69			

Haemodialysis patients in the experimental group was with mean pre-test score of 7.46, Standard deviation ± 0.77 and mean post test score of 4.26 with the standard deviation ± 0.69. The mean difference was found out to be 3.2 with standard deviation of mean difference of ± 0.4842. The 't' value obtained was 3.142 which is significant at $p<0.05$ level, Hence, the stated hypothesis (H1) was accepted. The hot water footbath effectively reduced level of fatigue in experimental group.

Table 3.2: - Mean, Standard Deviation, Mean Difference, Standard deviation of mean difference and 't' value among haemodialysis patients in experimental group and control group

S N	Post Test	Mean (Post Test)	SD (Post Test)	Mean Difference	Standard Deviation (MD)	'T' Test Value	'P' Value
1	Experimental Group	4.26	0.69	3.2	0.4842	14.04	0.05
2	Control Group	7.94	0.98	0.93	0.73		

Haemodialysis patients in experimental group was with the mean post test score of 4.26, standard deviation ± 0.69 and that of in the control group mean post test score was 7.94 with standard deviation ± 0.98. The mean difference in experimental group was found out to be 3.2 with standard deviation of mean difference ±0.4842, so as in the control group mean difference was found out to be 0.93 with standard deviation of mean difference 0.73. The 't' value obtained was 14.04 which is significant at $p<0.05$ level. Hence, the stated hypothesis (H1) was accepted. It revealed that the hot water foot bath effectively reduced level of fatigue among haemodialysis patients under study.

III.4 Association between post-test level of fatigue among patients undergoing haemodialysis with their selected demographic variables

Table:4.1 – Association of post-test level of fatigue among haemodialysis patients with their selected demographic variables in experimental group.

Demographic variables	Chi- value	Df	Inference
Age	9.11	6	Significant
Gender	26.21	2	Non-Significant
Education	9.76	10	Non-Significant
Occupation	7.22	8	Significant

Monthly income	7.2	4	Significant
Duration of illness	19.74	4	Non-Significant
Cycle of hemodialysis	10.58	4	Non-Significant
Any associated illness	0.352	2	Significant

In experimental group there was a significant association between the level of fatigue among haemodialysis patients with their selected demographic variables such as gender, education, duration of illness and cycle of haemodialysis except age, occupation, monthly income and any other associated illness.

Table:4.2 – Association of post-test level of fatigue among haemodialysis patients with their selected demographic variables in control group.

Demographic variables	Chi- value	Df	Inference
Age	1.35	6	Significant
Gender	24.60	2	Non-Significant
Education	6.08	10	Significant
Occupation	10.29	8	Significant
Monthly income	9.80	4	Non-Significant
Duration of illness	40.05	4	Non-Significant
Cycle of hemodialysis	13.05	4	Non-Significant
Any associated illness	0.352	2	Significant

In the control group there was a significant association between the level of fatigue among patients undergoing haemodialysis with their selected demographic variables such as gender, monthly income, duration of illness and cycle of haemodialysis except age, education, occupation, and any other associated illness.

IV Discussion

IV.1 Findings related to pre-test and post-test level of fatigue in experimental and control group.

The study findings predicted that in experimental group, 2 (7%) of them had moderate level of fatigue, 28(93%) had severe level of fatigue and no one had mild or no fatigue in their pre-test assessment likewise 04(13%) of them had mild level of fatigue, 26(87%) had moderate level of fatigue and none had severe and no fatigue in post-test assessment. In the control group, 09(30%) of them had moderate level of fatigue, 21(70%) had severe level of fatigue and no one had mild or no fatigue in their pre-test assessment likewise 4(13%) of them had moderate level of fatigue, 26(87%) had severe level of fatigue and no one had mild or no fatigue in their post-test assessment. A similar study was conducted by Dou J, which have shown moderate and severe level of fatigue in pre-test assessment and after provision of hot water footbath the severity turned down to mild and moderate. [6]

IV.2 Findings related to effectiveness of hot water foot bath on level of fatigue.

The current study results predicted that in experimental group, mean pre-test score of 7.46, Standard deviation ± 0.77 and mean post test score of 4.26 with the standard deviation ± 0.69. The mean difference was found out to be 3.2 with standard deviation of mean difference of ±0.4842. The 't' value obtained was 3.142 which is significant at $p<0.05$ level, Hence, the stated hypothesis (H1) was accepted. The hot water footbath effectively reduced level of fatigue in experimental group. In experimental group the mean post test score of 4.26, standard deviation ± 0.69 and that of in the control group mean post test score was 7.94 with standard deviation ± 0.98. The mean difference in experimental group was found out to be 3.2 with standard deviation of mean difference ± 0.4842, so as in the control group mean difference was found out to be 0.93. The 't' value obtained was 14.04 which is significant at $p<0.05$ level. The above findings were supported by a Rekha R, who conducted a study on the effectiveness of hot water footbath on level of fatigue among patients undergoing haemodialysis revealing a significant reduction in level of fatigue among haemodialysis patients in experimental group than that of control group. [7]

IV.3 Findings related to Association of post-test level of fatigue with their selected demographic variables.

It revealed that in experimental group, there was a significant association between post-test level of fatigue and demographic variables such as gender, education, duration of illness and cycle of haemodialysis were significant at $p<0.05$ levels. In control group there was a significant association between level of fatigue among patients undergoing haemodialysis with their gender, monthly income, duration of illness and cycle of haemodialysis. A similar study was conducted by Priya B., concluded significant association of post-test level of fatigue with selected demographic variables such as duration of illness and cycle of haemodialysis.[8]

V Conclusion

The study findings have shown that there was significant reduction in the level of fatigue among patients undergoing haemodialysis after the provision of hot water foot bath to them. Thus, concluding the hot water footbath is effective in reducing level of fatigue among patients undergoing haemodialysis.

Declaration by Authors

Ethical approval: The present study was approved by the Institutional Ethics Committee of Smt. Sindhutai Eknathrao Vikhe Patil College of Nursing of Pravara Institute of Medical Sciences (DU), Loni. [Ref. No. PIMS/SSEVPCON/2023/03/15)]

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